
Chapter 8

Indiana's Highway System Plan

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Background and Purpose

Indiana and its neighboring states in the Great Lakes Region are well served by highways including the Interstate System. In terms of highway density as (measured in miles per land area), Indiana has an Interstate density of 3.16 miles per 100 square miles, second only to Ohio in this region. The state's total highway mileage density is 254 miles per 100 square miles, again slightly lower than Ohio. This is more than double the national average of 0.99 miles per 100 square miles for Interstate and 109 miles per 100 square miles for all roads.

These statistics show that Indiana does indeed have an extensive and well developed highway system that has served the state's traditional manufacturing based economy well. At the same it time has provided market access for Indiana's agricultural products.

During the 1960's and into the mid 1970's, Indiana invested more aggressively than much of the nation to complete its Interstate System ahead of schedule, thereby enhancing the state's ability to take advantage of its strategic geographic location. In the 1980's, however, Indiana's spending on its highway system fell behind the national average. Highway expenditure information indicates that from 1980 to 1988 Indiana had the lowest per capita expenditure on highways of the whole Great Lakes Region. Indiana's expenditure of about \$47,000 per mile was significantly lower than the national average of \$64,500 per mile. The total highway expenditure of \$105,800 per mile was also the lowest in the region, and well below the United States aggregate value of \$139,500.

Although Indiana can still count upon its highway network as a competitive advantage, efforts to maintain and improve it must continue to be intensified if this edge is to be maintained. Both the health and future growth of the state's economy require a quality highway system.

Significant economic restructuring is occurring in both the United States and within Indiana. There are four basic transformations taking place concurrently: (1) changes in the production process; (2) structural changes in the industrial sector; (3) locational shifts in various economic activities; and (4) increased importance for the service sector of the economy. Each of these transformations has implications for future demand for transportation services and future demand on Indiana's highway system.

Federal highway legislation will continue to have a major influence on the development of Indiana's highway system. In December of 1991, Congress passed the first post Interstate surface transportation legislation, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). This Act declares that:

"It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient, environmentally sound, provides the foundation for the nation to compete in the global economy and will move people and goods in an energy efficient manner."

This legislation effectively establishes a new order of business for highway and transit programs, with increased transferability of funds, broader eligibility of projects for federal funding, and a new focus on reducing congestion and improving air quality in urban areas. Also, and most important for the state's highway system, the legislation expands upon the Interstate network with a new National Highway System (NHS) which would connect the 44,328 mile Interstate System with new and existing feeder roads, creating a 158,674 mile National Highway System (as proposed in the December 1993 submittal to Congress).

Given the importance of the highway system to the state's changing economy, the preservation and development of the state's transportation system is unquestionably a principal element in achieving and sustaining economic growth. The Indiana Department of Transportation can best support Indiana's economic development effort by reducing the overall costs of transportation and travel.

Consistent with the with our policy objectives focus on a transportation system that will support the state's economy, the Indiana Department of Transportation embarked on an effort to identify those aspects of the highway network which are most vital to the continued growth of Indiana's economy.

The "upper-end system" resulting from this effort provides primary access for Indiana's products and services to external markets and connect major population concentrations. This system defines Indiana's proposed 2,897 mile portion of the National Highway System called for in the 1991 federal legislation.

The highway portion of this multimodal system plan identifies the upper-end system and documents the methodology used in identifying the system. The upper-end system is the first step in developing a system plan for all state highway routes. This initial effort will be built upon in future years as better information about the performance of the highway system becomes available and more sophisticated analysis tools are developed. This system planning process will be built upon a cooperative

process with both the state's Metropolitan Planning Organizations (MPOs,) the INDOT Districts, and other sister state agencies which share responsibilities for the state's continued economy growth.

Another issue that should be highlighted in these introductory remarks is the rural focus of this plan. The reasons for this focus are several, including:

- The plan's major emphasis is on providing quality highway connections between the major population, manufacturing, and trade and service concentrations within Indiana and to major markets in surrounding states. Access to international markets is also addressed by connections to Indiana's three state owned ports and its two international airports. Two of Indiana's ports are located in urban areas while the third has a rural setting. Indianapolis International Airport and Ft. Wayne International Airport are in the largest urban areas of the state.
- The urbanized areas of the state with populations over 50,000 have ongoing transportation planning programs in place, some for almost thirty years, and the Department wishes to complement these programs. This can be accomplished through strengthening the Department's participation in the 3-C (continuing, comprehensive and cooperative) planning process.
- State highway miles are largely rural in character and perform the function of connecting cities and towns or carrying through trips, while most trips in urban areas are carried on the local jurisdiction's street system.

As INDOT builds on this plan in future years, the information and analysis tools the Department acquires will allow us to work more closely with the state's urbanized areas and also provide technical assistance to Indiana's smaller cities and towns. These cooperative efforts are consistent with the Department's policy objectives and will provide a basis for the urban connections needed to move people and goods in a manner that will support the state's economy.

Development of The Highway System

Introduction

As previously noted, federal legislation has been and will continue to be a strong influence on Indiana's highway system and its development. Starting with the first major federal aid legislation in 1916, which established a continuing highway

development assistance program, state highway development has largely followed federal initiatives. A broad policy overview of Indiana's highway system development is described below followed by more specific descriptions of federal and state roles in highway system development. Following these descriptions, a review of basic highway planning concepts involving functional classification and jurisdictional classification is presented.

In the early 1900's a "good roads" movement began the demand for higher quality paved highways for automotive traffic. Roadway needs were greatest in the rural portions of the nation where a common objective of "getting the farmer out of the mud" became a central theme for highway development. Urban areas had paved roadways which with the relatively low density of automotive traffic provided adequate service. In 1912, Carl Fisher, builder of the Indianapolis Motor Speedway, proposed a "coast-to coast rock highway" that later would become the Lincoln Highway (roughly following the route of US 30). This and other national road proposals became a stimulus for the Federal Aid Road Act of 1916.

Indiana's modern highway construction era began in 1919 with the creation of the Indiana State Highway Commission, later to become the Indiana Department of Transportation. In 1920, a state highway system of 3,200 miles, with a core "market road system" of 830 miles, was designated. This system steadily grew, reaching 10,000 miles in 1941, and provided paved roads linking Indiana's communities. Currently the state highway system covers 11,200 miles of the state's 90,000 plus miles of public roads.

A characteristic of the early development of the national highway program was its rural orientation. The original 1916 legislation prohibited aid to urban areas. This prohibition was gradually removed in subsequent federal aid highway acts which allowed limited federal assistance to urban roads. In the 1940's the growth of urban vehicular traffic was beginning to cause severe traffic problems in the nation's cities. The 1944 Federal Aid Highway Act established a program for urban extension highways to link the cities to the national roadway system. Until that time, the overwhelming majority of federal assistance was directed toward rural areas. The realization of the need for urban as well as rural transportation improvements produced more balanced national transportation programs. In the 1956 Federal Aid Act, which created the National System of Interstate and Defense Highways, 6,000 urban miles were included in the 41,000 miles of limited access highways. The need for improved urban transportation was addressed in the 1962 Federal Aid Act which created the comprehensive, cooperative, and continuous ("3C") transportation planning process in the nation's urban areas. In the 1970's additional transportation planning regulations resulted in the designation of Metropolitan Planning

Organizations (MPOs) in urban areas of over 50,000 population to conduct the 3C planning process. Currently twelve MPOs carry out transportation planning for the Indiana's larger urban areas.

In the 1980's the result of the long-term program of highway development had achieved a relatively extensive network of roadways. The increasing costs, both financial and environmental, of new highway construction, in addition to the increasing financial pressures being placed on government at all levels, resulted in fewer proposals for the construction of totally new highways.

This shifting focus of highway programs has placed priority on maintaining the existing system and selectively expanding only the most important transportation links. In the 1991 Surface Transportation Act, the concept of focusing federal resources on priority facilities of national significance has been articulated. This will define the "top end" of the current principal arterial system that serves major population concentrations, ports, airports, and international border crossings, meets national defense requirements, and serves interstate and interregional travel. This system will be known as the National Highway System or the "NHS" which has been referred to previously in this document.

This trend of placing priority on that top end system is echoed in this document in terms of defining the "upper end system" of state highways which support the state's economy.

Federal Highway Development Role

Early federal involvement in highway construction projects focused on opening the interior of the nation and expanding the national economy. The Cumberland or National Road, begun in 1829, was the first major federal highway construction project. Construction of this road through the central part of the United States was completed as far as Indianapolis in 1838. Following the Civil War, the federal government directed its attention toward railroads and delegated the building of highways to localities and states. Federal participation in highway activities between 1892 and 1916 was mostly in the form of education, promotion, and research work.

The Federal Aid Road Act of 1916 signaled the emergence of the federal government in highway financing and construction. This Act established the first on-going program of federal financial assistance for highway improvements. The 1916 Act established the structure for future federal highway programs in terms of limiting the federal role to providing funding assistance for the state's construction activities with federal approval and inspection rights. The act required the establishment of a State Highway Department as a condition to receive federal funds. Further, a specific

funding allocation formula was developed to distribute funds to the states on the basis of population, area, and road mileage, thereby limiting the political process in determination of each state's share. The Act came in response to rural needs for better roads in order to move goods from farm to market and specifically prohibited aid to urban areas. As a result of the 1916 Act, fragmented improvements were made to state highways which were not integrated into a consistent network of intercity links. The Federal Highway Act of 1921 was designed to address these problems by requiring states to select seven percent of their rural highway mileage for designation as a Federal Aid System. Roads on the system were to be developed with partial federal funding into a connected system of highways. The Federal Highway Act of 1921 also provided federal funding for extensions of the federal aid system through communities of 2,500 population or less.

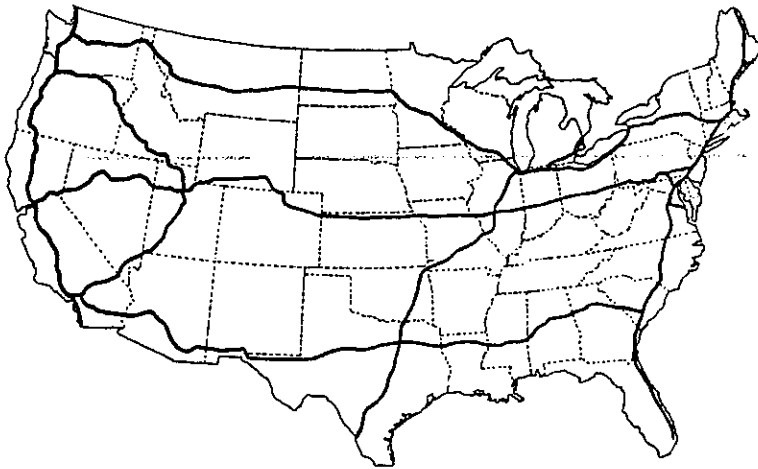
The 1920's saw substantial growth in the ownership and use of automobiles in the United States. Federal participation in the provision of highways began to increase and the Federal Aid Act of 1928 allowed federal funds to be used for the first time in towns of more than 2,500 population. Under the provisions of the 1928 Act, some extension of intercity highways was allowed within the limits of larger cities. The coming of the Great Depression initially reduced federal involvement in highway construction but did not bring an end to federal assistance. This initial reduction was reversed when highway construction became a major tool used in New Deal programs to alleviate the nation's unemployment problems. The Emergency Relief and Construction Act of 1932 was the first New Deal program concerned with highway construction. The 1932 legislation was followed by the Hayden-Cartwright Act which extended federal aid for highway construction to municipalities in order to provide assistance to the unemployed in the nation's cities. Regular federal highway assistance (as opposed to emergency relief measures) resumed in 1936.

Beginning with the 1934 Federal Aid Act, one and one-half percent of the amount apportioned to any state could be used for surveys, plans, engineering, and economic analysis for future highway construction projects. This act created the cooperative program between state highway departments and the then United States Bureau of Public Roads (now the Federal Highway Administration-FHWA) known as the statewide highway planning surveys. These surveys provided for an inventory of highway characteristics, traffic volume surveys, and mapping. By 1940, all states were participating in this program.

In 1938, Congress requested the Director of the Bureau of Public Roads to conduct a study of the feasibility of a toll financed system of three east-west and three north-south highways. The resulting study, "Toll Roads and Free Roads", found that the suggested toll road system would not be self supporting (see [Figure 1](#)).

FIGURE 1

EVOLUTION OF NATIONAL HIGHWAY SYSTEM



14,336 mile system of proposed superhighway in National Toll Road System - 1938 Study "Toll Roads and Free Roads"



39,000 mile system of interregional highways (33,920 rural plus 5,000 urban) 1944 study "Interregional Study"



40,000 mile interstate system designated August 2, 1947 (37,700 interstate miles plus 2,300 miles reserved for urban circumferential and distribution routes)

However, the report recommended the construction of a national highway system of direct, interregional highways with all necessary connections through and around cities. This report was released at the same time the General Motors Futurama exhibit at the 1939-1940 World's Fair was receiving widespread public attention. This display envisioned an American road system in 1960 of twelve-lane controlled access roadways with interchanges and 100 mile per hour speeds.

In 1940, the President requested the Bureau of Public Roads to conduct a survey of the adequacy of the highway system for national defense. On February 1, 1941 the report, "Highways for the National Defense", was published and suggested development of a strategic highway network to connect defense industry and military focal points. In April of 1941, President Roosevelt appointed the National Interregional Highway Committee to study the need for a national highway system. The resulting study published in 1944 as "Interregional Highways" recommended a 39,000-mile highway network and recognized the need for urban roadways including circumferential routes (see [Figure 1](#)).

The Federal Aid Highway Act of 1944 designated a 40,000-mile National System of Interstate Highways. However, Congress failed to authorize specific funding for this Interstate system. As a result of World War II, federal aid for highways was temporarily suspended. The 1944 legislation attempted to catch up with the resulting backlog of projects remaining from the depression and impeded by World War II through an aggressive federal funding program. Expenditures of \$500 million per year were authorized for the first three postwar years. The 1944 legislation authorized the expenditure of funds for the first time on urban extensions of the federal-aid primary and secondary highway systems. This new emphasis in the highway program stimulated the development of urban transportation planning procedures and studies.

Intensive study of the national highway program began with Congressional hearings in 1953. Between 1953 and 1956, several important reports were produced which provided estimates of interstate highway construction costs and identified the total cost of the program to be approximately \$27 billion. The reports recommended that the federal government contribute 90 percent of the interstate system construction costs and that the federal share be financed by long-term revenue bonds.

The Federal Aid Highway Act of 1956 established the Interstate Highway System and initiated the largest public works project in the United States history. The 1956 Act also established the Federal Highway Trust Fund, marking the first time that tax income from motor vehicles and highway expenditures were linked at the national level. The intent of the legislation was to make the highway program self-

financing through imposition of user fees. Creation of the Trust Fund was accomplished by transferring a variety of highway user taxes from the general fund and increasing them at the same time.

The 1962 Federal-Aid Highway Act required for the first time that adequate transportation planning be carried out by local areas prior to the expenditure of federal assistance. This legislation specifically required a planning process for highway projects in urban areas of 50,000 population or more. The Act stated that federal funds could not be used until it had been determined that a continuing, comprehensive, and cooperative ("3C") planning process was in place in a given community. The 1962 Act affected the transportation planning process in three significant ways. First, in recognition that traffic problems do not stop at municipal boundaries, it called for a planning process in urban areas rather than cities. Secondly, it called for a process carried out cooperatively between states and local communities and thirdly, the optimal use of one and one-half percent funds for planning and research allowed in the 1934 Act was restricted to these activities, not allowing these funds to be used for construction planning. In the regulations implementing the 1962 Act, the Bureau of Public Roads defined the various steps in the 3C planning process.

This defined the traditional four-step urban transportation planning process of: 1) Trip Generation, 2) Trip Distribution, 3) Mode Split, and 4) Trip Assignment. Also, in the early 1960's the use of computers allowed the development of large scale urban transportation planning studies. The 1962 legislation also provided federal relocation assistance to the states for payments to families and business displaced by highway construction.

The year 1966 marked an important change in the administration of federal highway assistance programs. The Department of Transportation Act shifted authority for highway programs from the Bureau of Public Roads in the Department of Commerce to the new Federal Highway Administration (FHWA) in the Department of Transportation.

The Federal Aid Highway Act of 1973 required the realignment of federal aid systems to conform to a functional classification system. The Act authorized expenditures on a new "federal aid urban" system. For the first time separate funding was provided for urban transportation planning. One-half of one percent of federal aid funds (PL funds) were made available to metropolitan planning organizations (MPOs) to carry out comprehensive urban transportation planning studies.

A major change in the funding formula used to allocate Highway Trust Fund receipts to the states came about as the result of the 1982 Surface Transportation Assistance Act (STAA). Indiana had been receiving an average of eighty-four cents per year for every dollar the state contributed to the Highway Trust Fund between

1956 and 1982. The 1982 Highway Act established a "Minimum Allocation" formula that guaranteed each state would receive at least 85 percent of the gas tax revenue it contributed to the Trust Fund.

The 1991 Intermodal Surface Transportation Efficiency Act increased the minimum allocation formula to 90 percent as well as expanding the legislation's scope from highways to an intermodal system. The 1991 Act calls for the designation of a new highway category, the "National Highway System," as a recipient of priority federal funding assistance. This National Highway System is to be made up of a portion of the nation's principal arterial system and will serve major population concentrations, ports, airports, and international border crossings, as well as meeting national defense requirements and serving interstate and interregional travel desires. The Act mandates each state conduct a re-classification study of their public road systems to identify their National Highway System.

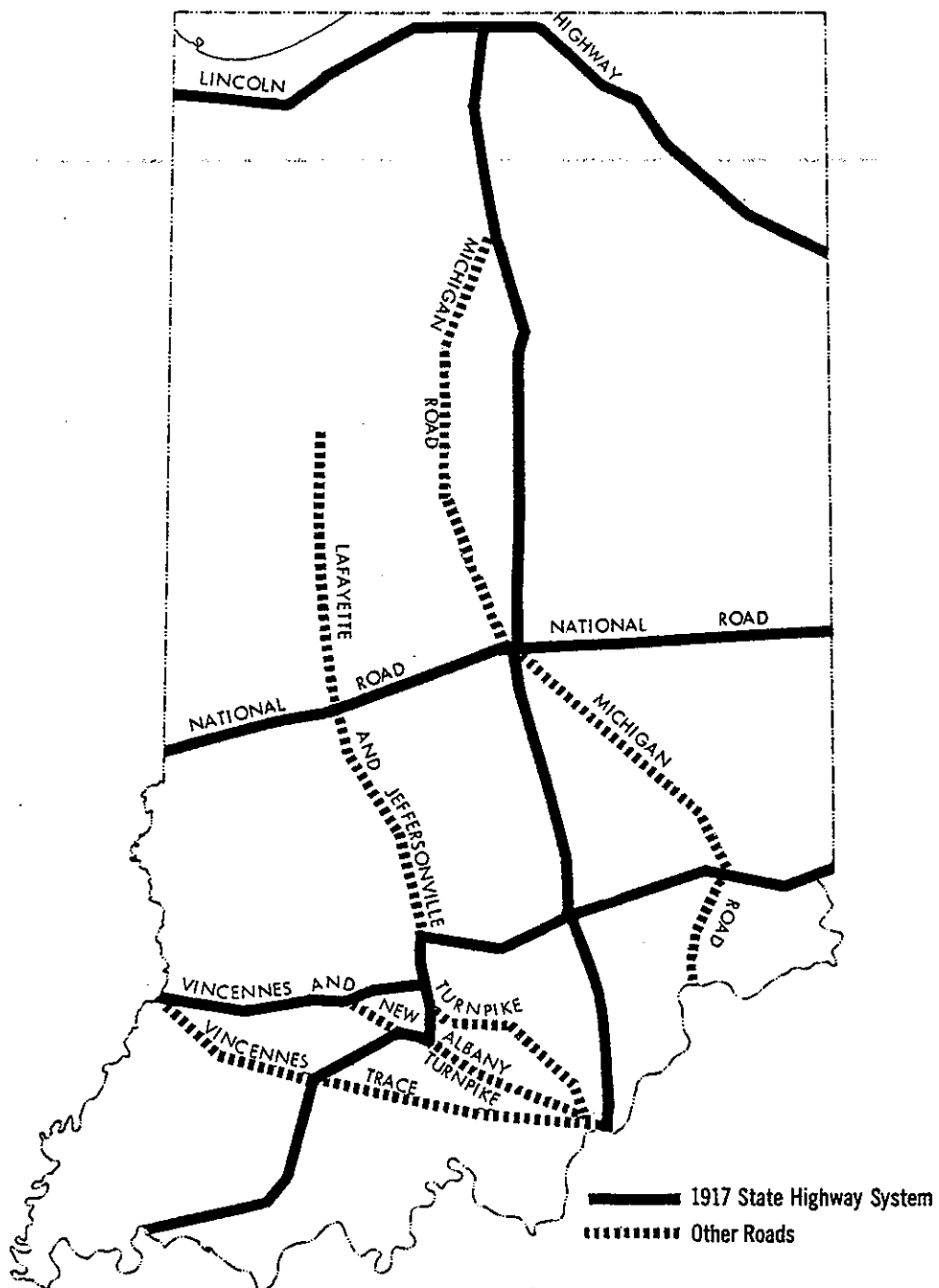
State Highway Development Role

State government played a small role in highway transportation development in the 1800's. Indiana's early road system consisted of trails and paths leading to county seats. As the state grew in population, new roads were needed and older roads required maintenance. In 1805 the Territorial General Assembly passed a law decreeing that all citizens of the territory would be required to work on roads 12 days per year.

When Indiana became a state in 1816, five percent of the funds derived from public land sales were set aside for the construction of roads and canals. Of the total amount of set aside funds, 60 percent were retained for use within the state under the direction of the state legislature; the remaining 40 percent was sent to the federal government to build roads connecting Indiana with other states. One of these federal projects was the National Road which cut across the state along the route of US 40. **Figure 2** illustrates the early transportation routes, including the major east-west National Road (1829) and the north-south Michigan Road (1828).

Following the settlement pattern, the legislature used its construction funds primarily to link communities in the southern part of the state with Indianapolis, the state capital. As no particular state office was responsible for state roads, the General Assembly had to authorize construction of each road by a separate legislative act.

FIGURE 2
EARLY INDIANA ROADS



Due to the heavy debt incurred by the internal improvement program, particularly the failure for bond issues for the state canal system, Indiana went into bankruptcy in the late 1830's. This fact, coupled with the coming of the railroad era, resulted in the state roads being turned over to private companies and counties for maintenance. Most new road construction was carried out by private companies who were permitted to charge tolls for the roads' usage. By 1843, the state had withdrawn from road building and other public improvement projects. Indiana's constitution was amended to prohibit debt financing by state government.

By 1877, Indiana had returned to highway construction and began to build gravel roads. Counties were authorized to issue bonds (to be retired by assessments on the benefiting property) to build these roads and to purchase private toll roads for use as free county roads. The responsibility for maintaining these roads was turned over to the counties until the early 1900's. During the early years of the twentieth century, motor vehicle use was beginning to expand and taxes assessed against motor vehicle owners and operators developed as an important source of revenue for state government. Indiana imposed its first highway user tax, a one dollar license fee, in 1905.

In 1916, federal assistance became available on a 50-50 match basis. The state raised the needed matching funds by adding a ten cent property tax levy and requiring that motor vehicle registration fees be used only for highway purposes. These two revenue sources were to be used exclusively for state highway purposes and not to be allocated to other units of government.

The State of Indiana created the Indiana State Highway Commission in 1917, partially in response to the Federal Aid Road Act of 1916. As was noted in the discussion about the federal role, this legislation required that state highway departments be established in order for states to be eligible for federal funds. Federal assistance was made available on a 50-50 matching basis and was only for construction in rural areas.

With creation of the Indiana State Highway Commission in 1917, the legislature earmarked three sources of revenue for highway purposes. These sources were:

- A portion of inheritance tax revenues received after April 17, 1917;
- Money recovered from steam or electric railroads for reimbursement of grade separation costs; and
- Legislative appropriations.

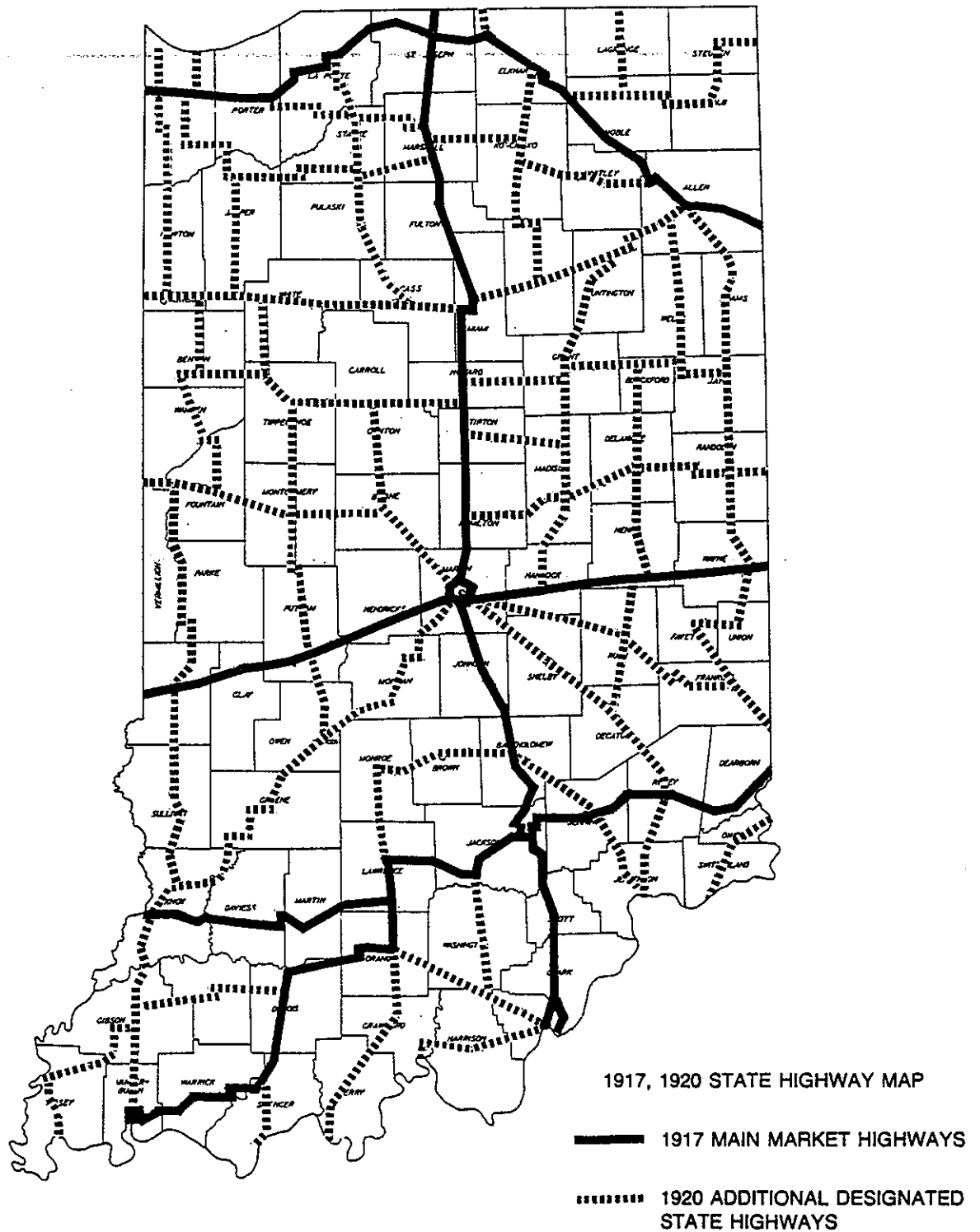
Funds were allocated to counties according to the proportion of all main market roads in each county. During the existence of the 1917 state commission, a total of 898.6 miles of main market highways were designated. The Indiana State Highway Commission had only been in existence a short time when the Act creating it was declared unconstitutional by a Hamilton County Court. The case was appealed to the State Supreme Court.

In the meantime, the Indiana legislature had repealed the law and passed another called the Duffy-Buller Law. This 1919 legislation created a new Commission and required the office to develop a system of state highways to connect every county seat, town over 5,000 population, and the trunk highways of adjoining states. In 1920, following an inspection of thousands of miles of Indiana roads, the Commission developed and released their plan for a state highway system. This original system consisted of 3,221 miles of state highways, or about five percent of the total road mileage in Indiana. See **Figure 3** for a presentation of the 1920 state highway system. In 1923 the General Assembly enacted the first state gasoline tax of two cents per gallon. The legislature also decided to return inheritance tax money to the general fund. The state property tax for highways was rescinded in 1925 and the gasoline tax was raised to three cents per gallon. The legislature also approved distribution of a portion of gas tax receipts to cities and towns. Distribution of net receipts was two-thirds to the state highway fund and one-third to local units of government. Counties were to receive three-fourths of the local share and the remaining quarter was apportioned to cities and towns according to their percentage of the state's municipal population.

To simplify management of the highway fund, the General Assembly in 1937 placed motor vehicle registration fees, gasoline taxes, and miscellaneous highway revenues into a Motor Vehicle Highway Account.

While the Indiana State Highway Commission was occupied with the development of state highway system, the General Assembly was investigating mechanisms for the construction of new interstate bridges. These investigations led the General Assembly to establish a Toll Bridge Commission in 1939. The legislature gave three basic powers to the Commission: 1) to construct toll bridges across any river or stream forming a boundary between the State of Indiana and any adjoining state; 2) to issue revenue bonds to finance construction; and 3) to collect tolls.

FIGURE 3
1920 HIGHWAY SYSTEM



As noted in the previous discussion of the federal role, development of Indiana's highways has been strongly influenced by federal legislative initiatives. The Federal Aid Highway Act of 1938 influenced this development during the 1940's. It first set out the concept of a national highway system made up of superhighways, potentially funded with toll revenue.

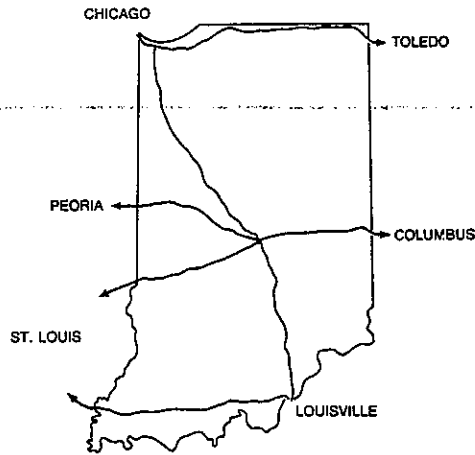
In response to this act, the Bureau of Public Roads conducted the feasibility study "Toll Roads and Free Roads" in 1939. As previously noted, the report concluded that financing the full cost of the superhighway network by direct tolls was not feasible. Two routes were proposed in Indiana both crossing the state east-west. The first route was roughly on the US 40-National Road alignment with the second crossing the northern edge of the state. It is interesting to note this second route's proposed alignment closely approximates the present I-80/90 Indiana Toll Road. The 1939 analysis found this northern route to be one of the ten most heavily traveled sections of the proposed superhighway network.

Further studies of national roadway networks were conducted in the 1941 report "Highways for National Defense" and the 1944 study "Interregional Highways". The Interregional Highways study recommended a 39,000 mile roadway system which became the basis for the 40,000 mile National System of Interstate Highways required by the Federal Aid Highway Act of 1944 and the 41,000 mile National System of Interstate and Defense Highways as authorized by the Federal-Aid Highway Act of 1956.

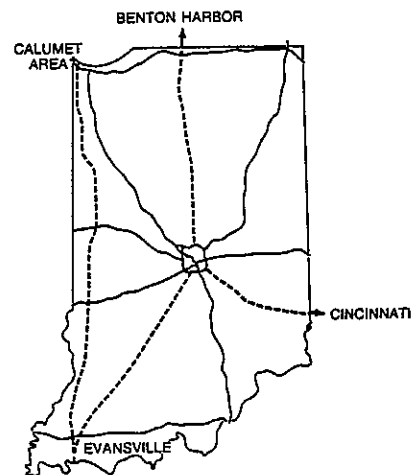
The 1944 Interregional Highways study recommended that five routes in Indiana be on the national system, these are listed below and shown in **Figure 4**.

- Chicago to Toledo;
- Chicago to Indianapolis/Louisville;
- St. Louis to Columbus;
- St. Louis to Louisville;
- Davenport/Peoria to Indianapolis.

FIGURE 4
EVOLUTION OF INDIANA'S INTERSTATE SYSTEM

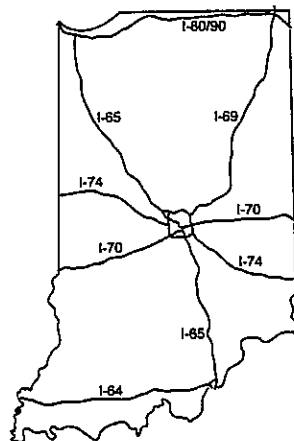


Interregional highways as proposed in 33,920 mile system from the 1944 Study "Interregional Highways"



Additional routes requested to be included into the national system by the Indiana State Highway Commission in 1946

- Indianapolis to Cincinnati
- Evansville to the Calumet area
- Indianapolis to Benton Harbor, MI
- Indianapolis to Evansville



National system of Interstate highways as designated on August 2, 1947
Total of 37,700 miles

The Federal-Aid Highway Act of 1944 called for creation of a National System of Interstate Highways not to exceed 40,000 miles in length. Before the interstate mileage within the 40,000 mile limitation was officially designated, state highway departments had the opportunity to review initial selections and suggest additional routes. The Indiana State Highway Commission requested four additional routes, also shown in **Figure 4**, be included in the system; these were:

- Indianapolis to Cincinnati;
- Evansville to the Calumet area;
- Indianapolis to Benton Harbor;
- Indianapolis to Evansville.

Of these proposed routes only the Indianapolis to Cincinnati route was approved. The two routes with connections to Evansville were not favored due to the lack of an interstate connection from the south. Kentucky at this time wished to hold its interstate mileage to a minimum due to the limited 50/50 federal matching ratios. As a result, Kentucky did not support the extension of Interstate 24 northward from Nashville to connect with Evansville. The proposed Indianapolis to Benton Harbor connection, which would serve to connect Indianapolis and South Bend, was considered an intrastate route due to Benton Harbor not being a major urban area and its close proximity to the Indianapolis to Chicago route. The National System of Interstate Highways as finally designated in 1947 also is shown in **Figure 4**.

Like other states during the late 1940's and early 1950's, Indiana did not place special emphasis on developing the proposed Interstate System. Preliminary planning was accomplished, but the Indiana State Highway Commission was more concerned with constructing state roads. The post war years, however, brought about increased travel and the need for more highways. In 1949, work was begun on the Tri-State Highway (from the Illinois-Indiana border to U.S. 20 in Gary) as a means of alleviating traffic problems in the northwest section of the state.

While the legislature recognized the need for more highways following the end of WW II, sufficient money was not available to undertake a major construction program. Instead of raising state gasoline taxes, the 1951 General Assembly opted to establish the Indiana Toll Road Commission. The legislation granted the Toll Road Commission powers to : 1) construct toll roads; 2) issue toll revenue bonds; and 3) collect tolls. By establishing the Toll Road Commission as an independent entity funded solely by toll revenue, Indiana was able to circumvent the constitutional prohibition on state debt. Construction of the 157 mile toll road linking the Chicago Skyway Bridge and the Ohio Turnpike was completed in 1956.

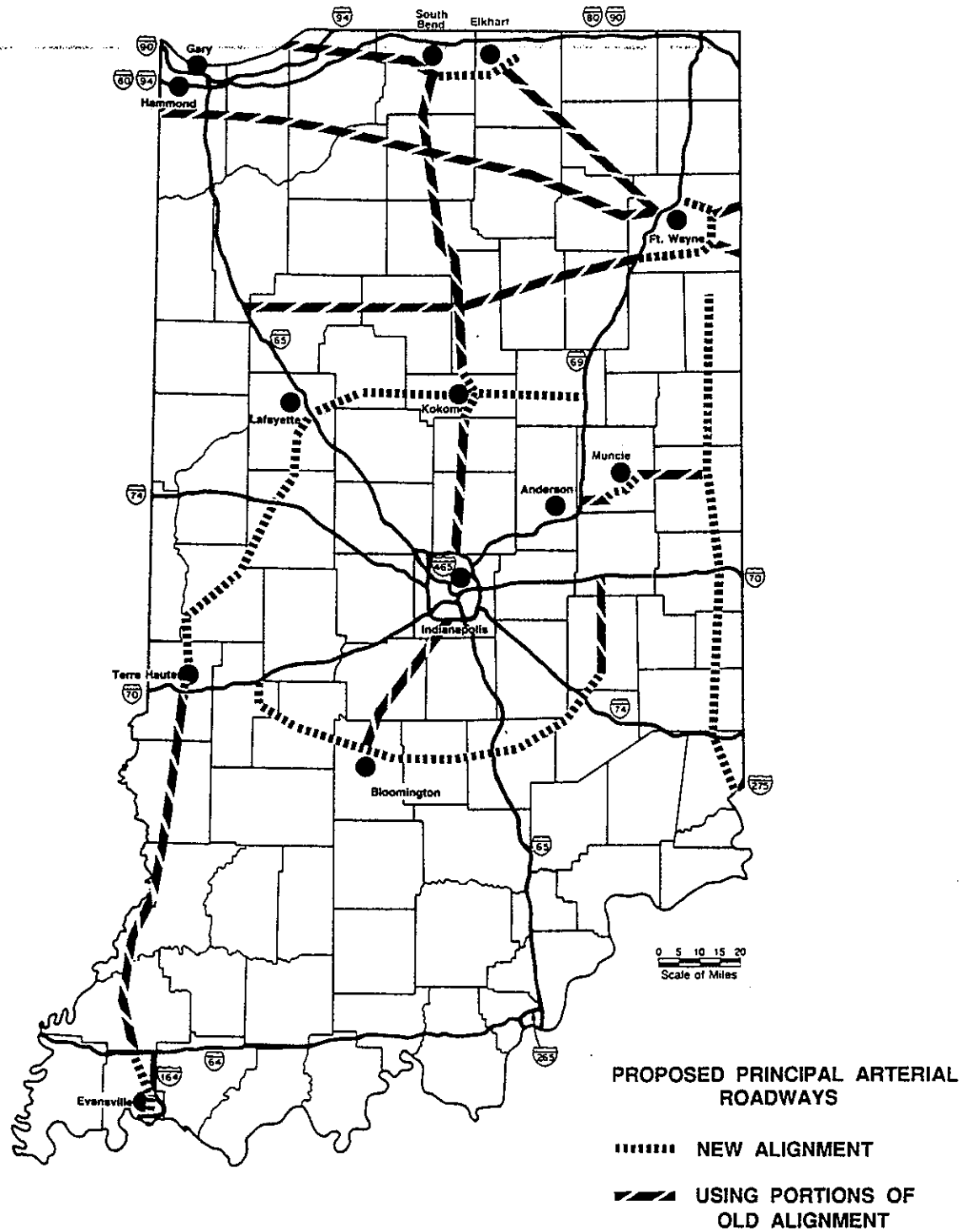
The year 1956 also marked the opening of Indiana's first toll bridge, the Wabash River Memorial Toll Bridge into Illinois. Ten years later the Toll Bridge Commission constructed two other toll bridges, the Cannelton-Lincoln Trail Bridge and the Matthew Welsh Bridge, both of which cross the Ohio River into Kentucky.

While the state was developing toll facilities, the federal government took action on the proposed Interstate System through passage of the Federal Aid Highway Act of 1956. This Act provided the first federal funding for construction of the system. Indiana, however, lacked sufficient state matching funds to begin construction, and the legislature responded by raising the state gasoline tax to six cents per gallon in order to secure the required 10 percent match. By 1957, Indiana had accumulated enough revenue to move aggressively into the Interstate construction program. Projects already under development in Indiana at the inception of the interstate program served as the basis for initial work. Consequently, Indiana was able to complete several Interstate projects within the first two to three years of the program by utilizing existing highway development plans. By December 1960, Indiana had completed construction of 115 miles of new Interstate, with 25 of these miles open to traffic. The mainlines of Indiana's system were completed by the end of 1976 even though much of the rest of the country's interstates were still under construction.

In 1965, the Indiana General Assembly mandated "A Comprehensive Study of the Future Needs and Financing of the Public Highways, Roads and Streets in the State of Indiana". This study completed in 1967, proposed a high quality 1,135 mile Principal State Highway System to supplement the Interstate System (see [Figure 5](#)). This principal system was to be built to standards similar to the interstate system with controlled access and high design speeds. Of the proposed 1,135 mile system only 241 miles were on existing alignment. In 1969 the General Assembly recognized the need for additional highway money and raised the gas tax from six cents to eight cents per gallon. The additional seventh and eighth cents were used to create two new accounts: the Primary Highway System Special Fund and the Local Road and Street Account. The Primary System Fund received 55% of the money from the two cent tax increase and provided funds for engineering, right-of-way acquisition, construction, and reconstruction of the Primary System. The improvements to the primary system were based upon the 1965-1967 highway needs study. This so called "Killer Highway Program" provided for four-laning 160 miles of primary roads.

FIGURE 5

1967 PRINCIPAL STATE HIGHWAY SYSTEM



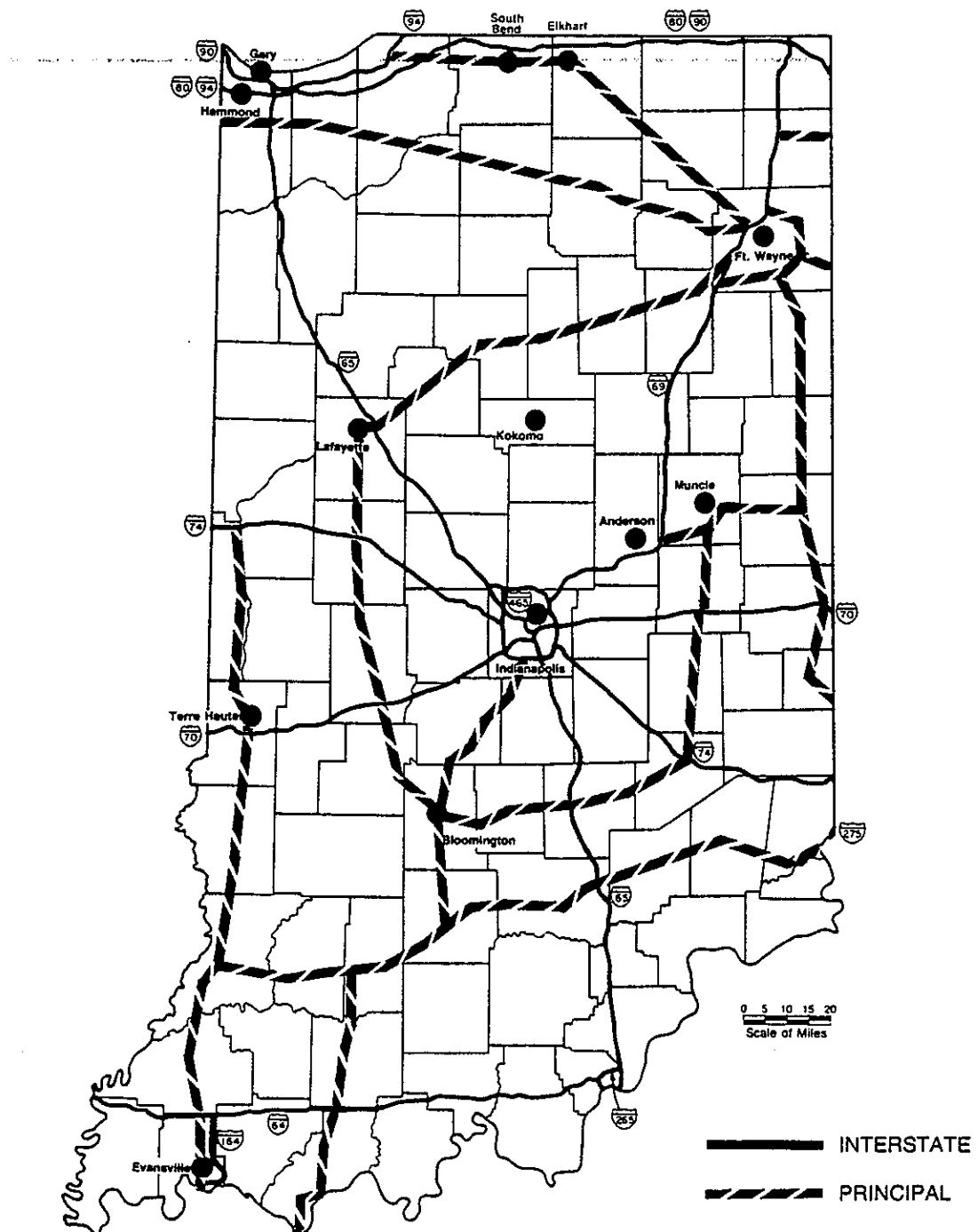
A comprehensive study of the functional classification system, required in the 1973 Federal Aid Highway Act, was completed in 1976. The Interstate and principal arterial systems are shown in the 1976 functional classification system map, **Figure 6**. The state gasoline tax remained at eight cents per gallon until 1980. By this time, revenues of the Motor Vehicle Highway Account had declined due to sharp increases in gas prices and the energy conservation of Indiana motorists. Reduced tax receipts severely constrained the state's ability to maintain highways and assist localities. As a result, the legislature changed the gas tax rate to a variable gallonage rate. The new gas tax rate was 8% of the average pretax retail price of fuel. This change brought the tax rate up to eight and one-half cents per gallon on July 1, 1980. Gasoline prices failed to increase during the late spring and summer of 1980, resulting in no change in the tax rate for January, 1981.

Another significant action taken by the 1980 General Assembly was the reorganization of state government transportation functions. On July 1, 1981 the Indiana State Highway Commission became the Indiana Department of Highways. Also created were the Transportation Coordinating Board, the Transportation Planning Office, and the Department of Transportation (for the modes of aviation, rail, and public transportation). The Department of Highways included the former Highway Commission, the Office of Traffic Safety, and the Toll Road and Toll Bridge Commissions.

The 1985 State Highway Revenue Act was significant in that it replaced general fund transfers for the highway program with motor fuel taxes. State fuel taxes were raised to 14 cents per gallon. Another major departure from past state highway fund practice occurred with the passage of bonding legislation in 1988. Under highway funding law, bonds were issued by the Transportation Finance Authority (formerly the Toll Finance Authority) to fund approximately 88 road construction projects. Once construction is completed, the highways are to be turned over to the Department of Highways under a lease-back agreement. Bond debt is to be paid from the Department's budget as well as from a penny per gallon increase (to 15 cents) in the state gasoline tax.

The 1989 General Assembly passed reorganization legislation for the state transportation functions. On July 1, 1989, the Indiana Department of Highways and the Indiana Department of Transportation were combined to form the Indiana Department of Transportation (INDOT), and the function of the Transportation Coordinating Board was replaced by the Department's Commissioner.

FIGURE 6
1976 FUNCTIONAL CLASSIFICATION SYSTEM



The Role of Highways In Indiana's Economy

Background

Transportation links Indiana's economic future with the world. Highways have proved to be an asset to competitiveness in most parts of the state and an adequate network will permit Indiana to take advantage of its geographic location.

The state cannot afford to allow its highways to become a liability for businesses trying to remain competitive. The relationship between Indiana's transportation systems and the state's economy is becoming increasingly apparent.

Transportation Implications

The restructuring taking place in Indiana's economy will have implications for transportation demand in the future. The highway system will have to serve the expanding service sector and a changing manufacturing sector. The implications of economic restructuring will be evident in the transportation of people and goods.

Changes to flexible production techniques will require more frequent goods movement. For the flexible production system to operate, a variety of inputs (custom parts, specialized labor, unique tools and equipment, an effective distribution system, etc.) must be available at production facilities precisely when needed. Then finished products must be transported rapidly to points of consumption. Failure to deliver inputs on time may disrupt the production process and result in significant losses for the producers. The implication for highways and other transportation modes is the growing importance of system reliability --- producers must be assured of receiving needed inputs at the right place and time.

Changes toward low-volume, high-value goods could mean that transportation services will need to provide quick transport for small quantities of high-value goods. This may have impacts on modal choice. Specifically, the need for truck services will put additional strain on Indiana's highways. The continued importance of manufacturing production activities will require Indiana to have a flexible and reliable highway system with good intermodal connections.

The scattering of production processes, made possible by advances in telecommunications and increased reliance on sub-contractors for inputs, will likely affect transportation systems. In the future, goods movements will increase in number and change rapidly. Shipping patterns will become increasingly complex. Therefore, the flexibility of transportation systems to accommodate rapidly changing traffic patterns will become more important. Due to the

flexibility they allow, highways and airways are likely to be used the most for transportation in the new economy.

Economic restructuring will likely affect the demand for transportation of people. Most routine jobs in the private sector will need good access to pools of low wage labor. At the same time, businesses will demand adequate transportation facilities within large geographic areas in order to reach customers with many different services, such as health care, insurance, banking and financial services and a variety of personal services.

Consistent with this plan's rural focus, no attempt was made to address in this document the changes in transport likely to occur in urban and suburban areas. Subsequent plans developed in cooperation with the urbanized area Metropolitan Planning Organizations (MPOs) will address Indiana's future urban and suburban transportation needs. As the service sector increases in importance, the ability to serve urban transportation needs will become more and more critical for sustaining economic growth in the state.

The highway system needs to support such an environment. The presence or absence of adequate transportation service is a critical factor in most location decisions. Not only are raw materials and finished goods conveyed to plants or markets, but employees, customers, service personnel, tourists and vacationers rely on transportation to get to their destinations. Businesses that are easy to reach are typically more successful than those with lower visibility and less convenient access. Transporting to a business with poor access costs more than transporting to one with good access. If improving transportation service can lower costs for businesses, increase clientele or expand market areas, that translates into a stronger state economy with potential for growth.

INDOT chose a series of objectives to focus its selection of a rural highway network. In essence, a good highway network would support Indiana's economic growth by:

- Linking Indiana's major population concentrations to the national highway network;
- Providing good accessibility to Indiana's major manufacturing concentrations;
- Providing good accessibility to Indiana's major trade and service concentrations;

- Improving access to Indiana's major tourism and recreation areas, regional economic concentrations and those areas with demonstrated and anticipated potential for growth;
- Adequately linking the major modal facilities to improve the overall transportation system; and
- Providing access to and from major markets and population concentrations in nearby states to better integrate Indiana with the national economy.

In the balance of this section, two approaches to identifying the economic activity concentrations and a rural highway network are explored. The first involves the identification of concentrations of economic activity at the county level. The second approach is that of the functional classification process which relies upon the identification of activity concentrations at the community or site level and the connectivity of the arterial highway system between these concentrations.

Concentrations of Economic Activity

As previously noted the chosen goal for transportation system planning in Indiana is to provide support for the state's economy, which tends to be concentrated in certain areas. Serving the areas of concentrated economic activity as well as possible will provide Indiana with a higher return for its transportation dollar.

This portion of the plan focuses on identifying which counties contain a concentration of economic activity. Counties have been used because most data is accumulated and readily available on a county basis. It is also updated regularly. INDOT used the most recent data available for its analysis.

As described earlier, the elements or sectors that contribute the most to Indiana's economy are manufacturing, trade (retail plus wholesale) and services. For location purposes trade and services were combined since these activities seem to coincide --- counties identified as having high levels of trade also have high levels of service activity and vice-versa, and both located where population is concentrated. The importance of population concentrations make them a natural choice for identification. INDOT determined which counties had major concentrations of economic activity comparing population, trade, and manufacturing employment for each county, using the 1990 U.S. Census, 1987 Census of Manufacturing, various Bureau of Economic Analysis tables, and the Indiana Business Research Center's *1989 Indiana Fact Book*. Six different

indicators were used in the concentration analysis. The criteria used to identify concentrations are: population size, trade employment, trade sales, manufacturing employment, number of manufacturing establishments and value of manufacturing shipments.

Population

Population information is often one of the best indicators of economic activity. It is logical to assume that where concentrations of population exist, concentrations of various economic activities will also be found. The state's larger urban concentrations, and locations with high population growth, require adequate transportation systems for the movement of people and goods. Nearly 70 percent of Indiana's population is concentrated in its larger urban areas. Serving these areas serves the majority of the population. Locations experiencing rapid growth frequently offer opportunities for business development. Investing in needed system improvements in these areas will support the attending economic development likely to be found there.

Areas of population concentration are defined as counties having 50,000 people or more, using the 1990 Census data. Because of their sheer size these counties serve as magnets for a variety of economic activities. Based on the population definition, twenty-four (24) of Indiana's ninety-two (92) counties qualify as population concentrations. The 1990 populations of these twenty-four counties along with their respective proportions of the total state population are listed in **Table 1**.

Together, the population concentrations comprise almost 69% of the 1990 state population of 5,544,159. The four largest counties, Marion, Lake, Allen and St. Joseph, contain over 32% of the state's population.

Trade and Service

Trade and service concentrations are those counties which maintain significant levels of wholesale, retail or service-related activities. Specifically, both employment and sales (or receipts) variables were used to define these concentrations. The best available data was found in the 1987 Census of Manufacturing, which was the most recent available. Overall, 19 counties were identified as having concentrations of trade and service activity. **Table 2** lists the counties, along with their respective employment figures. **Table 3** provides the sales and service receipts data for these concentrations.

Table 1
Major Indiana Areas of Population Concentrations

County	1990 Population	% of State
Allen	300,836	5.43
Bartholomew	63,657	1.15
Clark	87,777	1.58
Delaware	119,659	2.16
Elkhart	156,198	2.82
Floyd	64,404	1.16
Grant	74,169	1.34
Hamilton	108,936	1.96
Hendricks	75,717	1.37
Howard	80,827	1.46
Johnson	88,109	1.59
Kosciusko	65,294	1.18
Lake	475,594	8.58
LaPorte	107,066	1.93
Madison	130,669	2.36
Marion	797,159	14.38
Monroe	108,978	1.97
Morgan	55,920	1.01
Porter	128,932	2.33
St. Joseph	247,052	4.46
Tippecanoe	130,598	2.36
Vanderburgh	165,058	2.98
Vigo	106,107	1.91
Wayne	71,951	1.30
Total	3,810,667	68.77

Source: INDOT, Transportation Planning Division, 1994.

Indiana's trade and service concentrations account for approximately 77 percent of the state's employment and 78 percent of its sales in wholesale, retail and service-related businesses. **Tables 2 and 3** also illustrate the extent of Marion County's high level of trade activity. In 1987 nearly 24 percent of the state's trade employment and over 29 percent of its sales and service receipts were attributable to Marion County. Allen and Lake Counties are also important locations for trade sales and employment. Vanderburgh County, which demonstrated the highest level of trade in southern Indiana, accounts for about five percent of the state's service receipts, service employment and wholesale employment.

Table 2
Major Trade and Service Employment Concentrations, 1987

County	Wholesale	% of State	Retail	% of State	Service	% of State	Total	% of State
Allen	12,206	10.52	30,371	7.08	38,318	8.37	80,895	8.07
Clark	1,314	1.13	8,000	1.87	5,693	1.24	15,007	1.50
Delaware	1,874	1.61	10,826	2.52	9,628	2.10	22,328	2.23
Elkhart	5,356	4.61	12,477	2.91	12,813	2.80	30,646	3.06
Grant	757	0.65	5,348	1.25	6,646	1.45	12,751	1.27
Hamilton	2,566	2.21	7,248	1.69	6,517	1.42	16,331	1.63
Howard	1,029	0.89	7,647	1.78	6,401	1.40	15,077	1.50
Johnson	754	0.65	7,420	1.73	5,838	1.27	14,012	1.40
Lake	6,144	5.29	34,729	8.10	41,265	9.01	82,138	8.19
LaPorte	1,694	1.46	7,006	1.63	9,683	2.11	18,383	1.83
Madison	1,403	1.21	9,646	2.25	10,045	2.19	21,094	2.10
Marion	33,964	29.26	89,538	20.88	113,361	24.75	236,863	23.62
Monroe	1,267	1.09	10,031	2.34	7,763	1.70	19,061	1.90
Porter	1,464	1.26	7,719	1.80	7,750	1.69	16,933	1.69
St. Joseph	6,203	5.34	22,129	5.16	30,887	6.74	59,219	5.91
Tippecanoe	1,816	1.56	11,523	2.69	11,631	2.54	24,970	2.49
Vanderburgh	6,148	5.30	18,999	4.43	24,117	5.27	49,264	4.91
Vigo	1,886	1.62	11,308	2.64	9,995	2.18	23,189	2.31
Wayne	1,399	1.21	5,979	1.39	6,713	1.47	14,091	1.41
Total	89,244	76.89	317,944	74.15	365,064	79.71	772,252	77.01

Source: INDOT, Transportation Planning Division, 1994.

Table 3
Trade Sales/Receipts Concentrations, 1987

County	Wholesale	% of State	Retail	% of State	Service	% of State	Total	% of State
Allen	5,266,211	13.00	2,185,238	6.60	916,011	8.18	8,367,460	9.87
Clark	298,574	0.74	693,279	2.09	151,507	1.35	1,143,360	1.35
Delaware	445,409	1.10	697,780	2.11	206,323	1.84	1,349,512	1.59
Elkhart	1,640,435	4.05	1,061,347	3.21	386,954	3.45	3,088,736	3.64
Grant	133,385	0.33	433,874	1.31	93,573	0.84	660,832	0.78
Hamilton	1,202,217	2.97	527,433	1.59	220,283	1.97	1,949,933	2.30
Howard	241,500	0.60	607,622	1.84	130,234	1.16	979,356	1.15
Johnson	165,362	0.41	577,344	1.74	124,730	1.11	867,436	1.02
Lake	2,462,690	6.08	2,751,798	8.31	958,901	8.56	6,173,389	7.28
LaPorte	229,228	0.57	561,132	1.70	182,908	1.63	973,268	1.15
Madison	274,476	0.68	752,414	2.27	178,858	1.60	1,205,748	1.42
Marion	14,481,181	35.76	6,874,911	20.77	3,404,585	30.39	24,760,677	29.20
Monroe	457,995	1.13	617,044	1.86	168,288	1.50	1,243,327	1.47
Porter	339,458	0.84	569,168	1.72	223,966	2.00	1,132,592	1.34
St. Joseph	1,597,506	3.94	1,686,866	5.10	705,469	6.30	3,989,841	4.70
Tippecanoe	261,949	0.65	851,336	2.57	277,867	2.48	1,391,152	1.64
Vanderburgh	1,867,463	4.61	1,337,009	4.04	552,472	4.93	3,756,944	4.43
Vigo	480,911	1.19	1,161,686	3.51	231,239	2.06	1,873,836	2.21
Wayne	445,529	1.10	478,646	1.45	122,322	1.09	1,046,497	1.23
Total	32,291,479	80.0%	24,425,927	74.0%	9,236,490	82.0%	65,953,896	78.0%

Source: INDOT, Transportation Planning Division, 1994.

Manufacturing

Manufacturing has long been one of Indiana's strengths. In fact, in 1986 Indiana ranked second in the nation in percentage of gross state product attributable to manufacturing. Adequate highway service to the state's manufacturing concentrations is essential to Indiana's economy.

To measure manufacturing in Indiana three variables were selected as indicators. The 1987 Census of Manufacturing showed that 26 counties had high concentrations in terms of total number of employees, total number of establishments or value of shipments. **Table 4** lists the 26 counties that were identified as having high concentrations of manufacturing activity.

Marion County was prominent in all manufacturing variables. Overall, Elkhart County ranked second in manufacturing activity, with 50,000 employees, 855 establishments and over \$5.7 million in shipments, even though the county ranked sixth in population. Allen, Lake, Elkhart and Marion Counties together accounted for about 36 percent of the state's manufacturing employment, 35 percent of Indiana's manufacturing establishments and 39 percent of the state's total value of shipments.

Examining **Table 4** one observes that Lake County, with only 379 manufacturing sites, generally had larger employers than the other manufacturing concentration areas. In addition, Lake County's value of shipments was only slightly lower than Marion County's, despite the substantially larger number of plants and nearly twice the manufacturing labor force in Marion County. The steel industry has traditionally been the significant source of Lake County's high-value commodities.

Highway Functional Classification

Highway functional classification is the process by which streets and highways are grouped into categories based upon the traffic carrying functions they are intended to provide. The functional classification concept recognizes that travel occurs on a network of different road segments which make up an overall highway system. Travel is channeled within this network based upon the location of major travel generators and the traffic carrying ability of the network roadway segments. The functional classification process provides a basis for the planning a state highway network by determining the role the roadway should provide in serving the two principal functions: (1) mobility for through movements; and (2) access to adjoining land.

Table 4
Indiana Manufacturing Concentrations, 1987

County	Total Employees	% of State	Total Establishments	% of State	Value of Shipments (million \$)	% of State
Allen	36,600	6.22	532	6.16	4,020.0	5.02
Bartholomew	15,000	2.55	110	1.27	2,079.8	2.60
Clark	7,100	1.21	112	1.30	1,298.0	1.62
Delaware	11,200	1.90	188	2.18	1,177.3	1.47
Dubois	9,700	1.65	105	1.22	757.6	0.95
Elkhart	50,000	8.49	855	9.89	5,760.2	7.20
Floyd	4,900	0.83	102	1.18	N.A.	N.A.
Grant	10,800	1.83	91	1.05	1,202.7	1.50
Hamilton	5,000	0.85	138	1.60	470.5	0.59
Howard	18,100	3.07	75	0.87	2,494.1	3.12
Huntington	7,900	1.34	74	0.86	1,947.8	2.43
Johnson	4,400	0.75	109	1.26	496.9	0.62
Kosciusko	12,100	2.06	174	2.01	1,444.5	1.80
Lake	42,100	7.15	379	4.39	10,297.9	12.87
LaPorte	11,800	2.00	188	2.18	1,368.9	1.71
Madison	16,800	2.85	132	1.53	2,119.1	2.65
Marion	82,700	14.05	1,254	14.51	11,358.2	14.19
Marshall	5,700	0.97	122	1.41	681.9	0.85
Monroe	8,200	1.39	108	1.25	1,616.2	2.02
Noble	7,600	1.29	143	1.65	677.2	0.85
Porter	10,700	1.82	104	1.20	2,891.6	3.61
St. Joseph	23,200	3.94	489	5.66	2,887.6	3.61
Tiptecanoe	11,700	1.99	106	1.23	1,965.0	2.46
Vanderburgh	21,100	3.58	272	3.15	3,234.1	4.04
Vigo	9,700	1.65	130	1.50	1,810.5	2.26
Wayne	8,800	1.49	130	1.50	822.8	1.03
Total	452,900	76.92%	6,222	72.01%	64,880.4	100.0%

Source: INDOT, Transportation Planning Division, 1994.

Highway functional Classification concepts and criteria were applied to the nation's roadway system beginning with the passage of the Federal Aid Highway Act of 1921. The availability of federal funds for states to conduct planning surveys, as allowed under the 1934 Federal Aid Act, provided a means for the individual states to functionally classify their highway systems. During the 1940's this information was used in the identification of the National Interregional Highways, later to become the National Interstate System. In 1965, Congress mandated a biennial report estimating future highway needs and an evaluation of the federal role in meeting these needs. The results of this report found that the lack of a uniform highway classification system throughout the nation made the assessment of needs difficult. In response, the Federal Aid Highway Act of 1968 stipulated a nationwide functional highway classification study of existing facilities. As previously mentioned, the 1973 Federal Aid Highway Act required a comprehensive study. Per the Act, realignment of the federal aid system was to be based upon functional classification. By July of 1976 the functional

classification study and realignment of the federal-aid highway systems were completed.

As part of the ISTEA legislation, each state was required to conduct a full-scale evaluation or reclassification of the state's entire public roadway system. This effort was an early requirement in the process that led to selection of the National Highway System. Under the ISTEA guidelines only routes classified as principal arterials were to be considered for a state's national highway system proposal.

Indiana had last conducted a comprehensive review of its functional classification system in 1976. Since that time the department had continually reviewed and updated, as appropriate, the functional classification system. To meet the ISTEA requirements, a comprehensive review process was initiated. In this review process, the Transportation Planning Division assumed responsibility for the principal and minor arterial components and the Division of Roadway Management worked with the major and minor collector components.

In the summer of 1992, meetings were held with elected officials and transportation officials from local units of government in each of INDOT's six districts to solicit their participation in the functional reclassification process. A special effort was made in each MPO area to coordinate the functional reclassification of the urban street systems with that of the rural arterial system. In these activities, major traffic generators were identified statewide, as well as in adjacent states, and an assessment was made of the connectivity of the entire system. In early 1993, the functional reclassification study was completed and the results forwarded to FHWA.

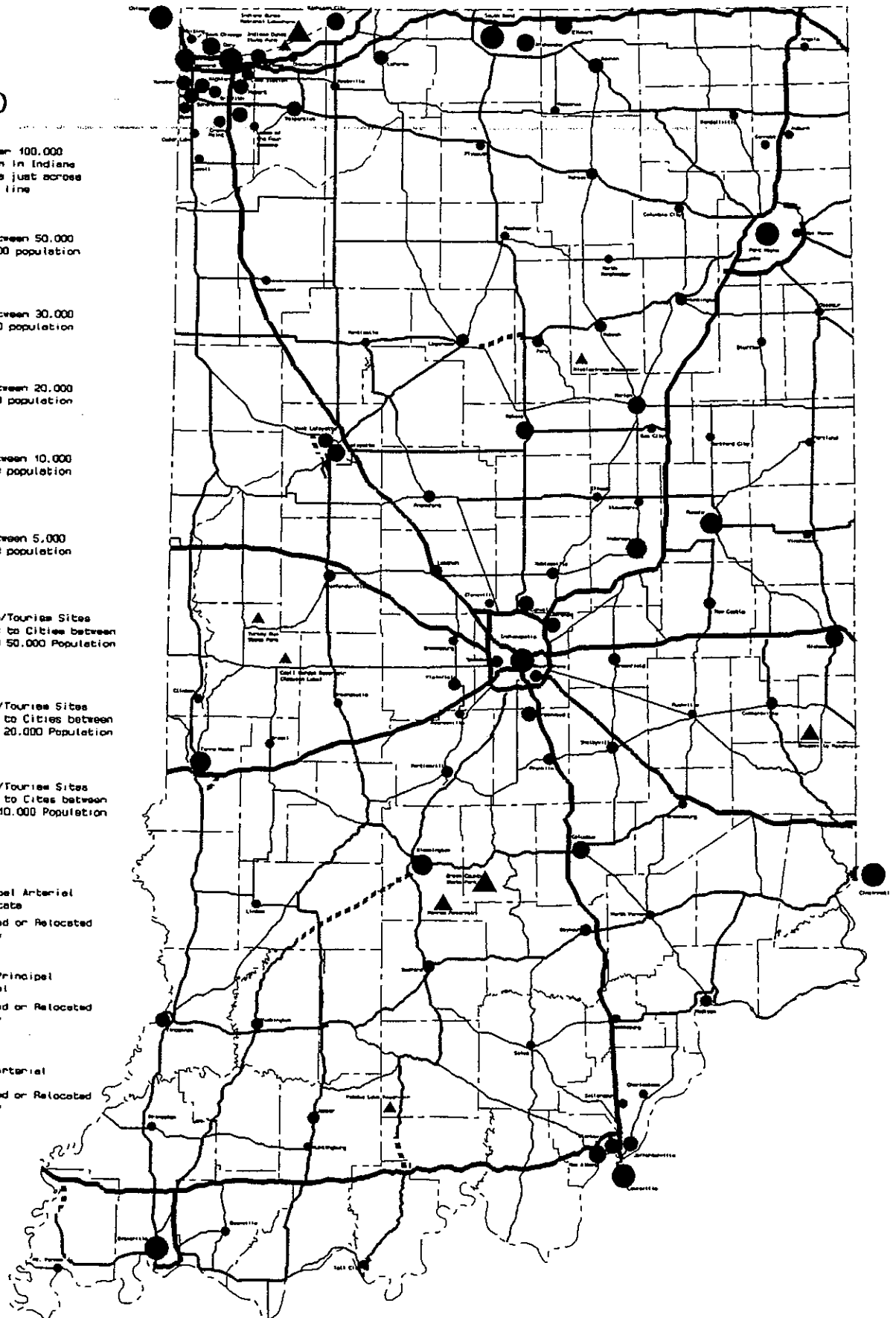
The major activity concentrations, measured in terms of city population size and recreation/tourism activity are presented in **Figure 7**, along with the current functional classification system for rural principal and minor arterials. This system is made up of the classifications shown in **Table 5**. This table also shows the miles by responsible jurisdiction (i.e. state highway system, county highway, or municipal/town). The characteristics for each functional classification are shown in **Table 6**.

FIGURE 7

INDIANA RURAL PRINCIPAL & MINOR ARTERIAL SYSTEM

LEGEND

- Cities over 100,000 population in Indiana plus those just across the state line
- Cities between 50,000 and 100,000 population
- Cities between 30,000 and 50,000 population
- Cities between 20,000 and 30,000 population
- Cities between 10,000 and 20,000 population
- Cities between 5,000 and 10,000 population
- ▲ Recreation/Tourism Sites Equivalent to Cities between 30,000 and 50,000 Population
- ▲ Recreation/Tourism Sites Equivalent to Cities between 10,000 and 20,000 Population
- ▲ Recreation/Tourism Sites Equivalent to Cities between 5,000 and 10,000 Population
- Principal Arterial Interstate
- Proposed or Relocated Roadway
- Other Principal Arterial
- Proposed or Relocated Roadway
- Minor Arterial
- Proposed or Relocated Roadway



In terms of the traffic carrying characteristics of the functional classification system, the upper classifications provide the most service. **Table 7** illustrates the traffic carrying characteristics of generalized functional classification merging the urban and rural categories. The Interstate system makes up only 1.23 percent of the roadway system yet it carries 21.7 percent of the state's traffic. Traffic is expressed as daily vehicle miles of travel (DVMT). Sixty-six percent of the state's traffic is carried by less than 10 percent of the roads. The last column (DVMT/MI) provides an indication of the volume of traffic carried by one representative mile of each functional classification. For example, on the average one mile of Interstate roadway carries 31540 vehicles per day compared to only 318 vehicles per day for the local roadway classification.

Table 5
1993 Indiana Highway Functional Classification Mileage

Functional System	State Jurisdiction	County Jurisdiction	City Jurisdiction	Total Mileage	Average VMT
Rural System					
Interstate	825.34	0	0	825.34	23126.87
Other Principal Arterial	1712.27	3.94	.44	1716.65	9187.35
Minor Arterial	2224.64	24.11	2.08	2250.83	4867.75
Major Collector	4746.46	5699.3	156.58	10,602.34	2479.24
Minor Collector	21.04	9650.98	144.27	9816.29	519.99
Local	52.66	45095.01	2752.88	47900.55	140.00
Total Rural	9582.41	60473.34	3056.25	73112.0	11477.71
Urban System					
Interstate	313.08	0	0	313.08	53719.13
Other Freeways & Expressways	124.6	4.84	6.25	135.69	20538.19
Other Principal Arterials	1124.62	140.42	282.31	1547.35	16704.09
Minor Arterials	208.73	881.34	1319.61	2409.68	7469.0
Collector	4.75	902.73	1279.14	2409.68	2619.58
Local	5.56	3797.02	8868.09	12670.67	990.88
Total Urban	1781.34	5726.35	11755.4	19263.09	4243.0
Total Urban & Rural	11363.75	66199.69	14811.65	92375.09	1793.18
Average VMT	8357.61	619.83	2001.04	1793.18	

Source: INDOT, Transportation Planning Division, 1994.

Table 6
Highway Functional Classification Characteristics

Functional Classification	Characteristics
1. Rural Principal Arterial	<ul style="list-style-type: none"> Serves corridor movements having trip lengths and travel densities indicative of substantial statewide or interstate travel. Serves virtually all urban areas of 50,000 and over and a large majority of those with a population over 25,000. Generally, rural arterials penetrate the urban boundary or are within ten (10) miles of the urban center and are within twenty (20) minutes travel time for the center. Provides an integrated network without "stub" connections.
(a) Rural Interstate	<ul style="list-style-type: none"> Principal Arterial already designated as a part of the Interstate highway system.
(b) Rural Other Principal	<ul style="list-style-type: none"> All non-Interstate highway principal arterials.
(c) Rural Minor Arterial	<ul style="list-style-type: none"> Links cities and larger towns (or major resorts) and form an integrated network providing interstate highway and intercounty service. Spaced at intervals so that all developed areas are within a reasonable distance of an arterial. Provides service to corridors with trip lengths and travel density greater than those served by rural collectors or the local road system. They should have a high overall travel speed with minimum interference to through movements.
2. Rural Collector	<ul style="list-style-type: none"> Serves travel primarily of intracounty importance. More moderate speeds may be typical.
(a) Rural Major Collector	<ul style="list-style-type: none"> Provides service to any county seat, larger towns, and other traffic generators (e.g., consolidated schools, county parks, mining, agricultural areas, etc.) not served by higher systems. Links these locations with nearby larger towns or with roads of a higher classification. Serves the most important intracounty corridors.
(b) Rural Minor Collector	<ul style="list-style-type: none"> Spaced at intervals to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road. Provides service to remaining smaller communities. Links locally important traffic generators with the rural hinterland.

Table 6 (Continued)
Highway Functional Classification Characteristics

Functional Classification	Characteristics
3. Rural Local	<ul style="list-style-type: none"> Serves primarily access to adjacent land. Provides service over relatively short distances. Provides an integrated network without “stub” connections.
1. Urban Principal Arterial	<ul style="list-style-type: none"> Serves major centers of activity, the highest traffic volume corridors, and long trip lengths. Carries a high proportion of total urban travel on a minimum of mileage. Integrated internally and between major rural connections. Carries a major proportion of trips entering and leaving the urban area as well as through movements. Serves significant intra-area travel. Provides continuity for rural arterials which intercept an urban boundary. Service to adjacent land is subordinate to major travel movements.
(a) Urban Interstate	<ul style="list-style-type: none"> Principal arterial already designated as a part of the Interstate highway system.
(b) Urban Other Freeways and/or Expressways	<ul style="list-style-type: none"> Non-Interstate, controlled access facilities.
(c) Other Principal Arterials	<ul style="list-style-type: none"> Principal arterials without access control.
2. Urban Minor Arterial	<ul style="list-style-type: none"> Interconnects with and augment the principal arterial system. Provides service to trips of moderate length. Distributes travel to smaller geographic areas. Places more emphasis on land access. Provides urban connections to rural collectors. Should not penetrate neighborhoods.
3. Urban Collector	<ul style="list-style-type: none"> Provides both land access and traffic circulation within residential neighborhoods, commercial, or industrial areas. May penetrate residential neighborhoods. Distributes trips from arterials to locals and collect trips from locals and channel them to arterials.

Table 6 (Continued)
Highway Functional Classification Characteristics

Functional Classification	Characteristics
4 Urban Local	<ul style="list-style-type: none"> • Provides direct access to adjoining land. • Provides access to higher systems. • Lowest level of mobility; discourages through traffic movement.

Source: INDOT, Transportation Planning Division, 1994.

Table 7
1993 Indiana Urban and Rural Highway Data

Functional Classification	Total Miles	Percent	Average Daily VMT	Percent	Average DVMT Per Mile
Interstate	1,138.42	1.23	35,905,913	21.68	31,540.13
Other Principal Arterial	3,399.69	3.68	44,405,363	26.80	13,061.59
Minor Arterial	4,660.51	5.04	28,954,385	17.48	6,212.7
Collector	22,605.25	24.47	37,118,189	22.41	1,642.02
Local	60,571.22	65.57	19,261,149	11.63	318.0
TOTAL	92,375.09	100.0	165,644,999	100.0	1793.17

Source: INDOT, Transportation Planning Division, 1994.

IDENTIFYING INDIANA'S PORTION OF THE NATIONAL HIGHWAY SYSTEM

Introduction

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) called for the establishment of the National Highway System (NHS). This system is to consist of 155,000 miles (plus or minus 15 percent) of major roads in the United States, including all Interstate routes, a percentage of urban and rural principal arterials, the Strategic Highway Corridor Network (STRAHNET) and its connectors. As required in the legislation, the Secretary of Transportation submitted a proposed NHS, based on submittals by the individual states, before the end of 1993 on December 9 of that year. The NHS must be designated by law by September 30, 1995.

This section outlines the process by which Indiana's portion of this NHS was identified. The process drew upon work completed by the Department during the 1988 to 1991 period for development of a preliminary Highway System of National Significance. This work was conducted as a planning exercise by the Department in cooperation with FHWA. The initial system was reviewed in the context of analysis of a core highway system and its impact on the state's economy. This planning effort defined an upper level highway system of major commercial routes linking the state's economic activity concentrations. The highway system formed by integrating these two planning perspectives provided the basis for development of Indiana's portion of the NHS. The functional reclassification study, also mandated by the 1991 Act, allowed for further refinement of the NHS proposal. This study was largely conducted during 1992. In conjunction with the functional reclassification study, a process to obtain local participation in defining both urban and rural routes was undertaken.

Legislative Overview

Development of the underlying philosophy of the 1991 Intermodal Surface Transportation Efficiency Act was a combined, multi-year effort of the American Association of State Highway and Transportation Officials (AASHTO), the FHWA, the National Association of Regional Councils, and various special interest groups, such as the trucking industry. This effort, initiated in 1988 under guidance of AASHTO, was known as Transportation 2020. It was designed to create a consensus on transportation policy and influence the highway reauthorization legislation. A major thrust of this consensus building process was to formulate new national transportation goals for the post Interstate construction era. Identification of a national goal to define a transportation system of national significance and focus federal resources on development of that system resulted from this process. Once this system is designated, state and local governments will assume more responsibility in managing the rest of the system. Emphasis has been placed on shifting from categorical grants and rigid standards to more flexible programs. These can better reflect the priority of state and local government in developing a second level system.

To better define a transportation system of national significance, FHWA initiated a voluntary planning exercise to review the nation's principal arterial system and identify a preliminary Highway System of National Significance. This process consisted of two parts: (1) states were asked to review and revise their principal arterial systems to better meet guidelines of a system with four percent rural mileage and ten percent urban mileage, and (2) portions of this principal arterial system and routes anticipated to be included in the principal

arterial system carrying no more than 42 percent of the state's traffic (measured by vehicle miles of travel) were identified.

As a result of this planning exercise, regional differences in the various states' approaches to developing their portions of the proposed Highway System of National Significance were identified. In 1989 these regional differences reached a sufficient level for FHWA to abandon the voluntary planning exercise. However, work on defining a National Highway System was reinstituted by FHWA in 1990 as a result of a congressional mandate. To assist with its deliberations on the highway reauthorization legislation, the U.S. House Committee on Public Works mandated FHWA to develop an "illustrative" National Highway System. To satisfy this mandate FHWA allowed states wide latitude in development of their respective NHS systems. Three levels of systems were requested. The first carrying 40 percent of the state's travel, a second carrying 35 percent of the state's travel, and a third optional system was left to the individual states to develop under their own criteria. In December 1990, FHWA completed development of the illustrative 150,000 mile National Highway System.

Indiana's National Highway System Submittal

In 1989, the Department began working with FHWA to develop the preliminary Highway System of National Significance. The initial review of Indiana's Principal Arterial System (PAS), showed the rural PAS mileage to be well below the four percent federal guideline at 2.7 percent and the urban PAS mileage to be very close to the ten percent federal guideline at 9.8 percent. Following resumption of work on the system in 1990, three alternatives for the NHS were developed. These three alternative systems were consistent with FHWA's 35 percent VMT level, a 40 percent VMT level, and an optional system using independent criteria. The three alternative systems are shown in **Figure 8**.

The system mileage and vehicle miles of travel for these three alternatives is presented below, in **Table 8** with the optional network reflecting the revisions made in response to FHWA's review.

FIGURE 8
INDIANA'S PORTION OF THE NATIONAL HIGHWAY SYSTEM

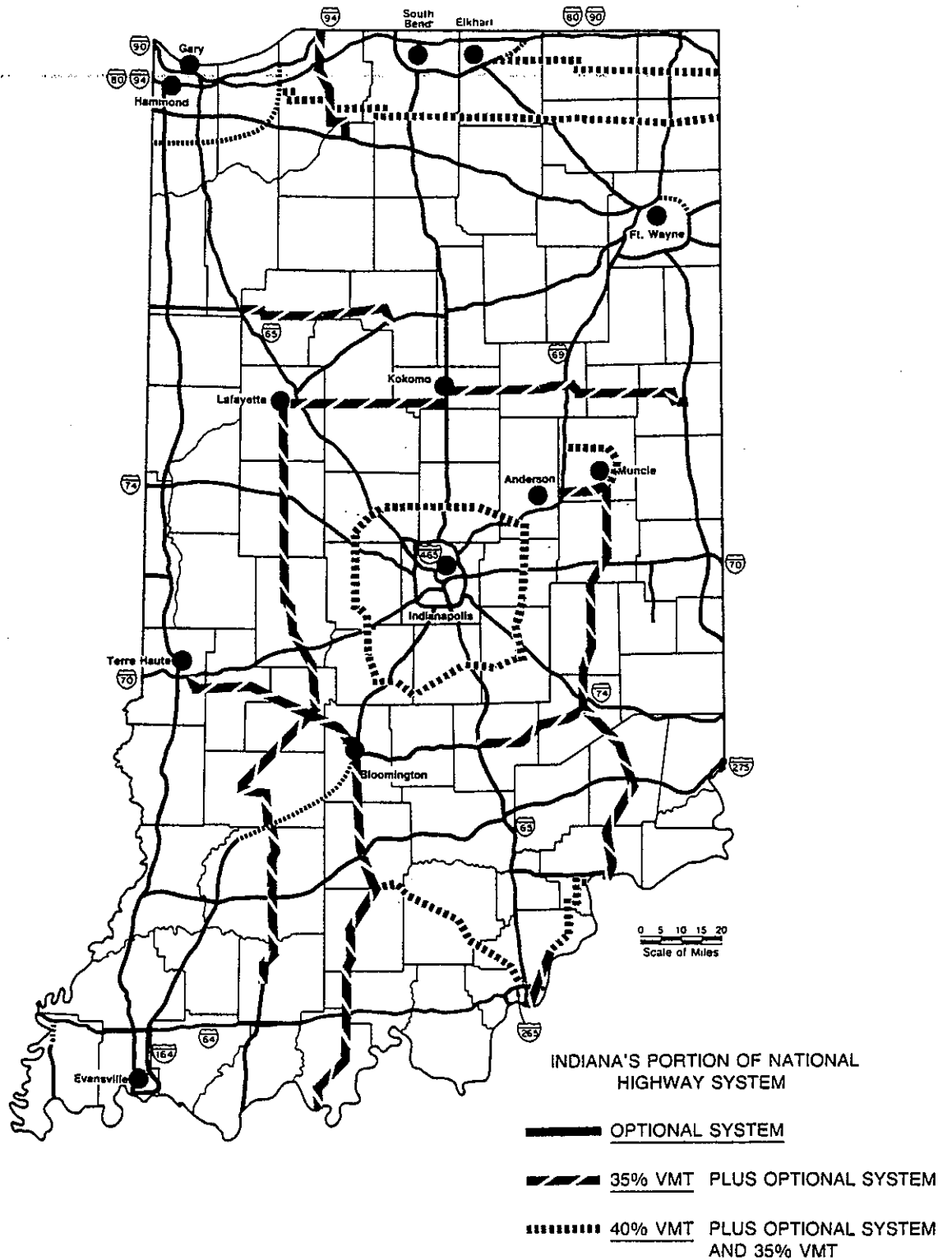


Table 8
Indiana NHS Mileage Summary

National Highway System Alternative	Rural Miles	Rural VMT	Urban Miles	Urban VMT	Total Miles	Total System VMT
35%	2,632	31,654,549	648	19,218,677	3,280	50,873,226
40%	2,992	34,227,655	757	21,374,210	3,749	55,601,865
Optional	1,973	27,942,564	537	17,674,195	2,510	45,616,759
Total System VMT		80,522,000		66,593,000		147,115,000

Source: INDOT, Transportation Planning Division, 1994.

The Indiana NHS development process was based upon identification of major population concentrations, proposed new routes, port facilities, military installations, and the Strategic Highway Corridor Network (STRAHNET) and its connectors.

Starting with results of the principal arterial system review, successive overlays were developed which added or subtracted mileage necessary to meet the established federal targets. The Department reviewed the rural portions of the system and obtained input from the state's Metropolitan Planning Organizations (MPOs) on the system's urban portion. A preliminary urban route identification was provided to the MPOs and they were invited to recommend revisions. The Department then reviewed the recommendations to include only routes of national significance and avoid "stub" routes. The resulting urban routes were then identified for each VMT level.

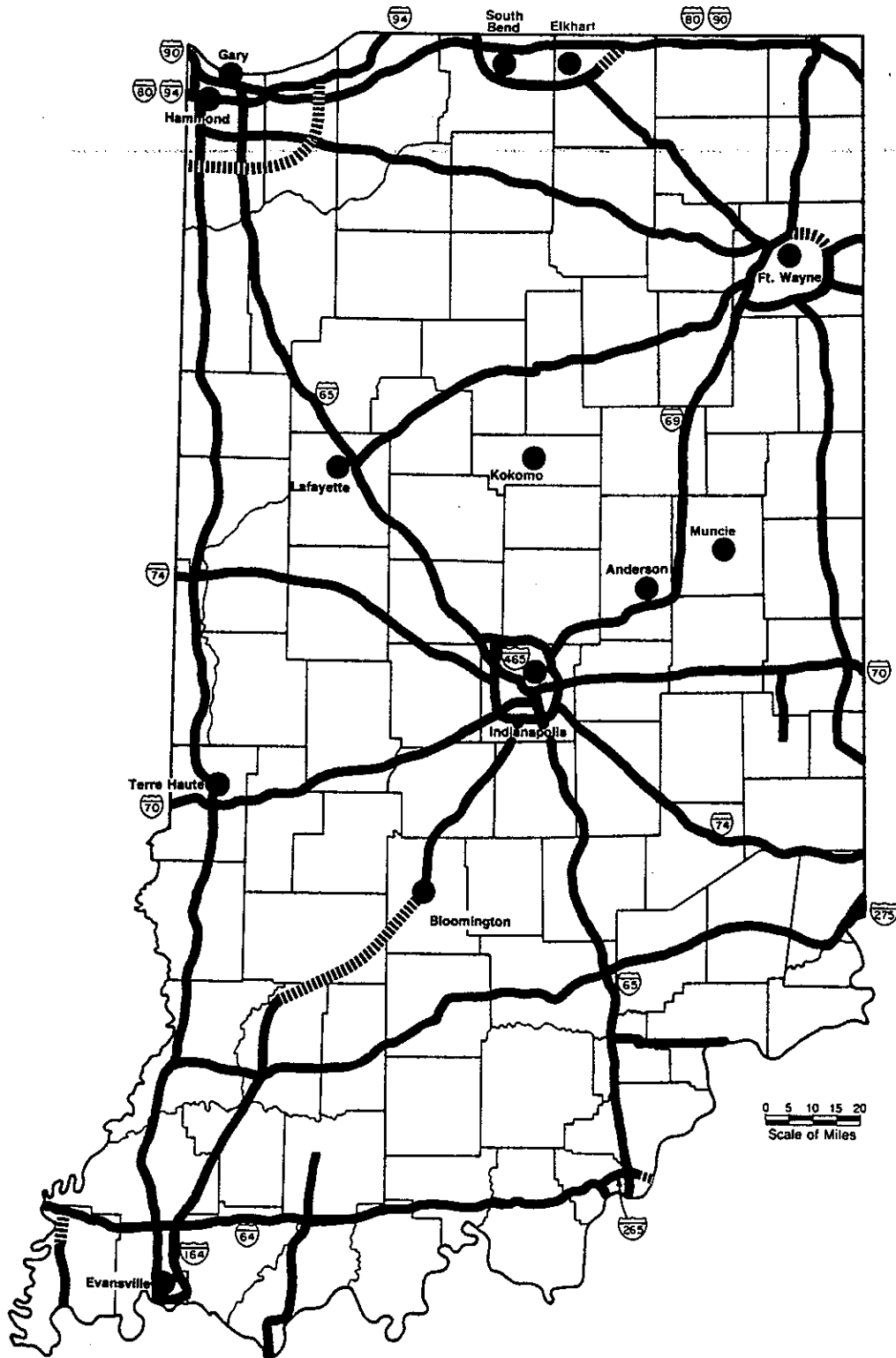
In recognition of the high design standards anticipated for designated NHS routes, the Department adopted a conservative approach for development of the optional system. Based upon interdivisional review, the optional system contained only those routes judged to be highly significant to national objectives. The FHWA reviewed Indiana's initial NHS submittal and made minor changes to connect the systems of neighboring states and provide access to all communities with 10,000 or more residents. This revised "optional" system was then used by FHWA to identify Indiana's portion of the 150,000 NHS as submitted to the House Committee on Public Works (see **Figure 9**). As required by the new 1991 transportation legislation, the revised initial system served as a starting point for refining the NHS.

Identification of Major Commercial Routes

When the Indiana Department of Transportation started the process that led to development of this multimodal plan, it was decided the first step in

FIGURE 9

INDIANA'S "OPTIONAL" NHS SYSTEM



developing the highway portion of the plan would be to define an upper end system of highways that will best support Indiana's economy. This section describes how the highways in the commercial route network were selected and shows how this network differs from the Department's earlier (1990) NHS submittal. Finally, this section will describe how the Department refined the final NHS proposal for Indiana.

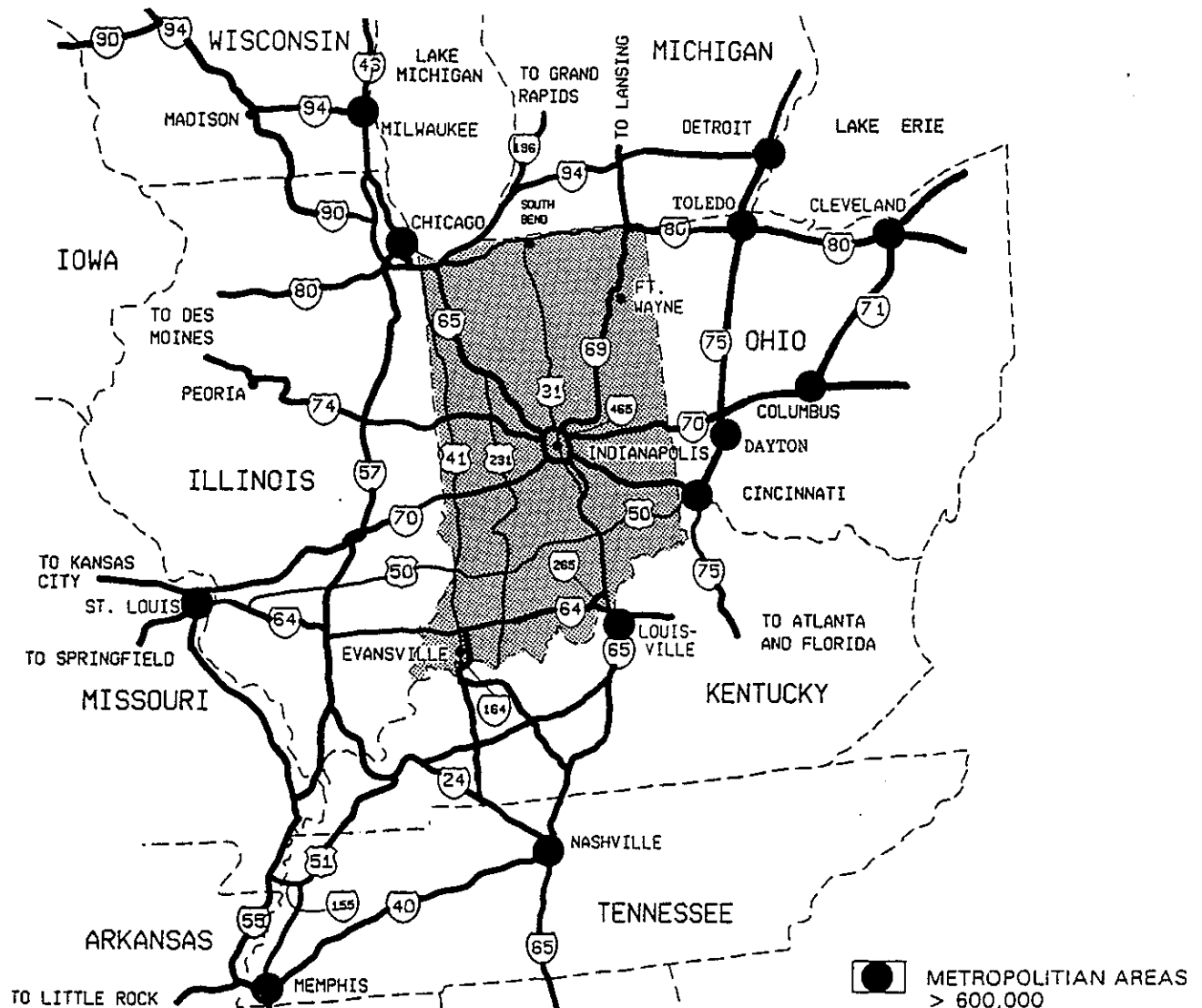
Consistent with the focus of supporting the state's economy, the major commercial routes were selected with the objective of providing an interconnected network of high quality highways linking the activity concentrations within Indiana, and connecting those concentrations with major markets in surrounding states. The principles used to guide corridor selection were as follows:

1. Link Indiana's major population concentrations to the national highway network;
2. Provide good accessibility to Indiana's major manufacturing concentrations;
3. Provide good accessibility to Indiana's major trade and service concentrations; and
4. Improve access to Indiana's major tourism and recreation areas, regional economic concentrations and those areas with demonstrated and anticipated potential for growth.

The major external markets for Indiana were considered to be urban areas over 600,000 in population and less than 500 miles from the state. Based on those criteria Indiana's major external markets are: Chicago IL, Louisville KY, Cincinnati OH, Milwaukee WI, Cleveland OH, Columbus OH, Dayton OH, Toledo OH, Nashville TN, Memphis TN, St. Louis MO and Detroit MI. **Figure 10** shows these major external markets and the major routes that connect the state to them.

Access to Indiana's ports at Burns Harbor (Porter County), Southwind Maritime Centre (Posey County), and Clark Maritime Centre (Clark County) were included in defining the transportation corridors. These sites give Indiana access to international markets.

FIGURE 10
INDIANA AND ITS MAJOR EXTERNAL MARKETS



Selection of Major Commercial Routes

Once the major commercial routes were selected, the next step in development of this highway network was the selection of routes that would serve these concentrations.

The principles used in the route selection process were as follows:

1. Include all of the interstate system;
2. Avoid duplication of current interstate and other major routes;
3. Provide connectivity and continuity of the overall system; and
4. Make use of high quality existing routes where appropriate.

In addition to these principles, access to important intermodal sites, such as the previously mentioned ports, was considered. The network resulting from this process (see **Figure 11**) includes 2,393 miles of Interstate and other major routes, which provide extensive geographic coverage and service to high traffic corridors. If a watershed of twenty miles is considered (ten miles on each side) even more of the state is covered. Using such 20 mile wide corridors, it was determined that over 95 percent of the state's population lives within ten miles of the major commercial route network.

The amount of traffic on the major commercial route network was also considered. Detailed information on the amount of traffic by segment was available for each route. The 2,393 mile major commercial route network represents only three percent of the total miles of roads and streets in Indiana, yet it carries over 30 percent of the total vehicle miles traveled. When only INDOT's share of all roads and streets is considered, the major commercial route network represents about 25 percent of the system but carries over 50 percent of the traffic. (see **Table 9**)

FIGURE 11
COMMERCIAL ROUTE NETWORK

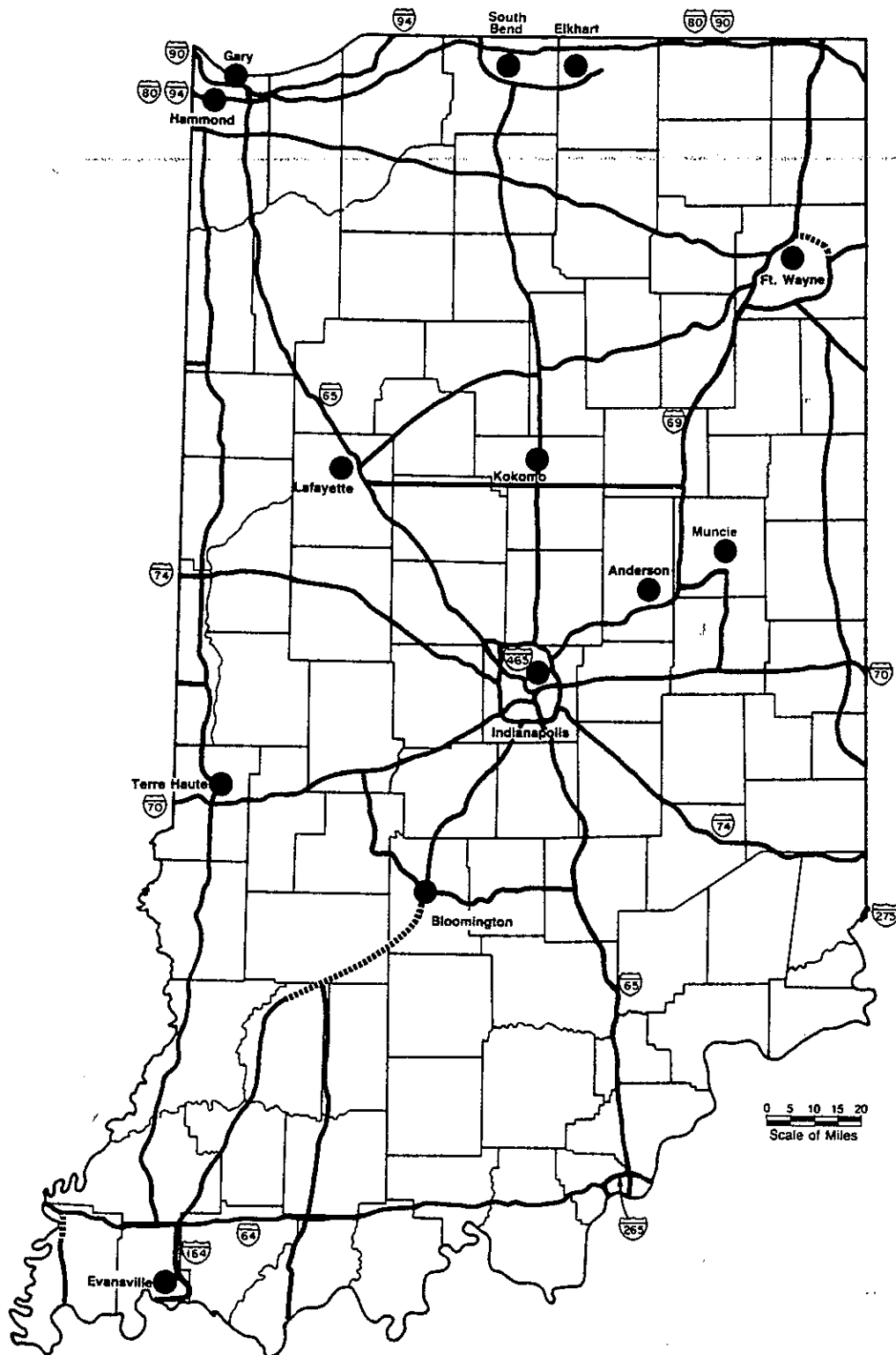


Table 9
Major Commercial Routes

Route	Miles	% of State	Daily VMT	% of State	Daily VMT/Mile
Existing Routes:					
I-465	52.00	2.17	3,597,910	2.45	69,191
I-94	40.00	1.67	2,540,620	1.73	63,516
I-65 South	106.00	4.43	3,453,928	2.35	32,584
I-70 East	66.00	2.76	2,057,080	1.40	31,168
I-70 West	73.00	3.05	2,180,670	1.49	29,872
I-65 North	132.00	5.51	3,667,330	2.50	27,783
I-265	6.00	0.25	164,270	0.11	27,378
I-69	156.00	6.52	3,963,720	2.70	25,408
SR 37	42.84	1.79	845,475	0.58	19,736
I-80/90	172.00	7.19	3,264,560	2.23	18,980
I-74 East	75.00	3.13	1,402,140	0.96	18,695
US 30	116.81	4.88	2,085,869	1.42	17,857
US 31	120.43	5.03	2,101,783	1.43	17,452
I-164	19.00	0.79	259,590	0.18	13,663
US 41/SR 63	261.27	10.92	3,387,837	2.31	12,967
I-74 West	73.00	3.05	929,700	0.63	12,736
I-64	121.00	5.06	1,528,360	1.04	12,631
SR 3/SR 67	13.69	0.57	142,479	0.10	10,408
US 33	52.58	2.20	482,618	0.33	9,179
US 231/SR46	66.17	2.76	558,204	0.38	8,436
US 24/SR 25	106.29	4.44	839,976	0.57	7,903
US 27	107.46	4.49	775,084	0.53	7,213
US 231 (Jasper)	46.73	4.95	330,722	0.23	7,077
US 231 (River)	34.69	1.45	242,694	0.17	6,996
SR 57	38.77	1.62	220,415	0.15	5,685
SR 69	14.25	0.60	60,311	0.04	4,232
SR 26	67.07	2.80	255,781	0.17	3,814
Connections	4.48	0.19	12,127	0.01	2,707
Other Interstate	59.00	2.46	3,733,794	2.55	63,285
Sub-Total	2,243.53	96.73	45,085,047	30.74	588,552
New Routes:					
I-469	50.00				
US 20 Bypass	50.00				
SR 69 (New)	50.00				
Sub-Total	150.00				
Total Miles	2,393.53	96.73	45,085,047	30.74	588,552

Source: INDOT, Transportation Planning Division, 1994.

System Integration

As mentioned in the introduction of this section, the next phase in developing the NHS was to integrate the initial NHS submittal, the major commercial route network and their respective planning viewpoints. As previously noted the initial NHS submittal emphasized those routes carrying the majority of the state's travel, while the commercial route network focused on

supporting the state's economy. To bring these two systems together, their respective component routes have been placed in the category of "consensus corridors" if they are common to both systems, or in the category of "routes for further study" if they are part of just one of the systems.

Routes which fell in the consensus corridor category, such as the Interstate system, were identified as core routes to be contained on the final NHS with only minor exceptions. The second category, routes for further study, provided a focus for Department studies on system identification such as the 1992 functional reclassification study.

Corridors For Further Analysis

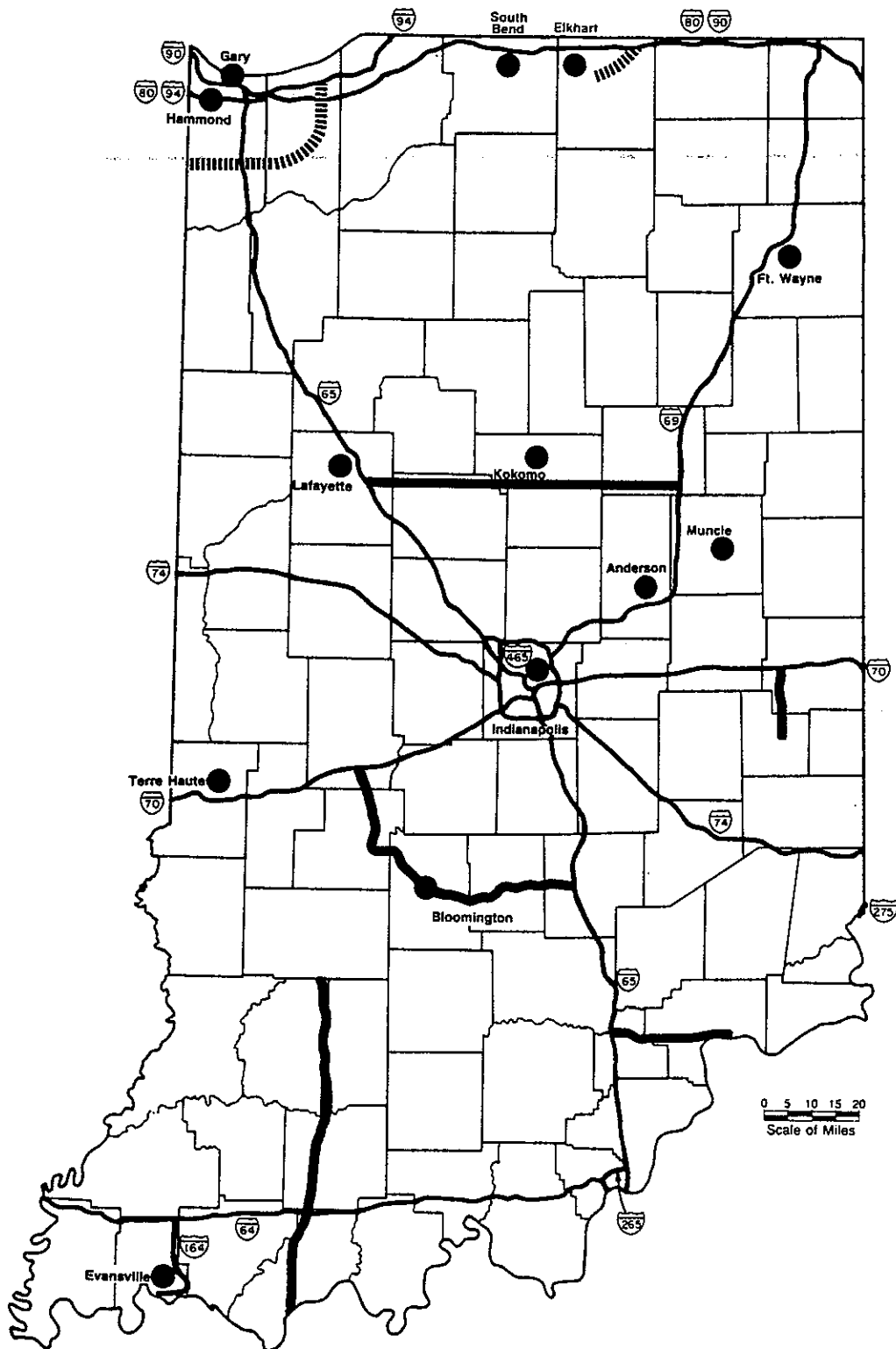
Some corridors included in the commercial route network were not a part of the initial NHS submittal, but there were strong economic reasons for including US 231, SR 26 and SR 46 network. Other routes (the South Suburban Expressway, the South Bend Bypass extension, US 50, the STRAHNET system and its connectors, and the connections to Madison and Connersville) were analyzed before the "final" NHS was completed.

These other routes are identified in **Figure 12**, followed by a brief description containing some background and data.

South Suburban Expressway

Traffic volumes on the Borman Expressway, (I-80/I-94) in Lake County exceed 100,000 ADT in some areas. Such volumes are among the highest in the state. One proposal to reduce some of the congestion in this area is to build a new expressway south of the Borman in Lake and Porter counties. This proposed route was included in the initial NHS submittal and is included in NIRPC's long range plan. However, during the functional reclassification process it was determined that this route did not meet FHWA criteria for inclusion as a designated future route, i.e. INDOT has made no commitment to the route and it would not be possible to have construction underway in the next five or six years, given that no preliminary work has started on the route. For this reason it is not eligible for consideration as a principal arterial, the required classification for NHS routes.

FIGURE 12
CORRIDORS FOR FURTHER ANALYSIS



South Bend Bypass Extension

The final terminus of this route in Elkhart County was still indeterminate at the time of the initial NHS submittal; however, the route was included in the that submittal. In the months that followed, it was decided that the bypass would terminate at Elkhart County Road 17. The route was included in the final NHS proposal.

U.S. 50

U.S. 50 serves as a connector between Cincinnati and Vincennes. It is also an alternative route to I-64 and a connector to major north-south roads in the area. U.S. 50 carries approximately 1.5 percent of the state's traffic volume on its one hundred sixty eight (168) miles and was included in the initial NHS submittal. This route was included in the final NHS submittal not only for the above reasons, but also to provide service to a large portion of southern Indiana.

S.R. 46 and U.S. 231

S.R. 46 serves as a connector between Columbus and Bloomington and then via U.S. 231 and I-70 connects these cities to Terre Haute. This route is also a connector between two interstates, I-65 and I-70. There are two areas of economic concentration that are directly served, Bartholomew and Monroe counties, and one county indirectly, Vigo. S.R. 46 carries 0.63 percent of the state's traffic volume. During the functional reclassification study, it was also determined that the recreation/tourism sites of Brown County State Park and Monroe Reservoir have enough annual visitors to be equivalent to cities with populations of 30,000 to 50,000 and 10,000 to 20,000, respectively. For these reasons the S.R. 46 and U.S. 231 route was included in the final NHS submittal.

US 231 Jasper to Rockport Bridge

US 231 is a connector between the proposed Indianapolis to Evansville highway and I-64. The section from I-64 to the proposed Rockport Bridge connects Indiana's NHS to Kentucky's system. The route is approximately 80 miles long and carries 0.66 percent of the state's traffic volume. It was included in the final NHS proposal for the above reasons but also because US 231 between I-70 and I-64 is a STRAHNET connector and the section south of I-64 was included for system continuity with Kentucky's final NHS proposal.

S.R. 26

SR 26 serves the urbanized, manufacturing area of north central Indiana between Lafayette and Marion. This route also links two Interstates, I-65 and I-

69. This relatively short route connects three counties with activity concentrations. Tippecanoe, Howard and Grant and carries 0.17 percent of the state's traffic volume. It also connects Anderson and Muncie via I-69 and SR 26 to Kokomo and Lafayette as an alternative to going through the Indianapolis area. During development of the final NHS proposal, the Kokomo MPO requested that US 35/SR 22 serve the corridor from I-69 to US 31, in lieu of SR 26. Both the Kokomo and Lafayette MPOs supported SR 26 between US 31 and I-65. These routes were included in the final NHS submittal.

STRAHNET

The Strategic Highway Corridor Network (STRAHNET) is a system of highways, including the National System of Interstate and Defense Highways (NSIDH), identified as strategically important to the defense of the United States. The purpose of this national system is:

1. In peacetime, to maintain the readiness of our fighting forces, to assist in the maintenance of a credible deterrent posture, and to enable the rapid mobilization of military forces during increased tension;
2. In wartime, to gather and deploy personnel and equipment as needed; and;
3. To support industrial mobilization.

This military road network uses the Interstate system in Indiana and, since the Interstate system does not go directly to the military bases, a connector system is required. These routes include about 50 miles that were not part of the commercial route network. The final NHS submittal included the STRAHNET system and its connectors to priority one and two military installations in response to a federal requirement that these routes be included.

Connections to Madison and Connersville

In order to serve all cities over 10,000 population, one of the criteria used by FHWA in developing the illustrative NHS, SR 256 and SR 1 were added to connect Madison and Connersville to Indiana's initial NHS submittal. The final NHS submittal did not include these stub routes. The FHWA instructions for developing the final NHS removed the Access America program from the specific criteria to be considered. Indiana reevaluated these stub connections, including consultation with the Kentucky Transportation Cabinet about US 421, and found that these routes were not logical extensions of the NHS.

Identification of the Final National Highway System Proposal

According to the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, the National Highway System is to consist of 155,000 miles (plus or minus 15 percent) of major roads in the United States. The June 12, 1992 "Instructions for Developing the National Highway System (NHS)" included the following required elements: the Interstate System, the Strategic Highway Corridor Network (STRAHNET) and its connectors to priority one and two military installations and the Congressional High Priority Corridors. The system which was submitted by the Secretary of Transportation on December 9, 1993, must be designated by law by September 30, 1995. In the interim, the NHS will consist of all highways functionally classified as principal arterials.

The starting point for selecting Indiana's portion of the National Highway System was the illustrative NHS provided to Congress in 1991. As noted earlier, this network included 2505 miles of highways and served 31 percent of the state's vehicle miles of travel (VMT). The functional reclassification study required by ISTEA also helped with route selection for the final NHS proposal. This reclassification study was completed by the State in accordance with the guidelines and time schedules established by the Secretary of Transportation.

In addition to the illustrative system and the results of the functional reclassification study, initial route selection was guided by the June 12, 1992 Instructions for Developing the National Highway System and the analysis of Indiana's economy. For purposes of system continuity across state boundaries, INDOT contacted the surrounding states of Michigan, Ohio, Kentucky and Illinois to determine which routes they planned to include at their boundaries with Indiana. Based on this information and internal discussions, INDOT prepared a preliminary rural system.

This preliminary rural system served as a starting point for discussions with the state's twelve MPOs on how the rural system might interact with urban routes they felt should be included. After much discussion a set of common criteria was developed to guide selection of routes not listed as required elements (e.g. Interstates, Congressional High Priority Corridors, etc.) in the urbanized areas. The MPOs then followed their local involvement procedures to obtain input from local officials, stakeholders and the public. It was also suggested that they invite members of the Indiana General Assembly from their area to any local

meetings. Based on this process the MPOs provided suggestions for routes in their respective areas they felt should be part of the NHS proposal. In almost all cases INDOT was able to incorporate the suggested routes in the final proposal.

Following coordination with the MPOs, the Department arranged three public meetings; Jasper (south); Granger (north) and Indianapolis (central), to obtain broader public input. A letter of invitation was sent to all county commissioners and county engineers or road supervisors, all mayors and town council presidents of cities and towns over 5,000 population, the Association of Indiana Counties, the Indiana Association of Cities and Towns, the Indiana Motor Truck Association, the Indiana Port Commission, the Indiana Department of Commerce, all railroads with Indiana offices, the Indiana Transportation Association, rural transit systems, intercity bus companies, the Aviation Association of Indiana, regional planning agencies, the Indiana Farm Bureau and the Hoosier Environmental Council. A copy of the letter was also sent to the MPOs inviting their further participation. The letter mentioned all three meetings, so people could attend any of the three. Accompanying the invitation was a map showing the preliminary final NHS proposal.

In addition to the individuals and groups previously mentioned, INDOT's Division of Public Affairs sent a letter of invitation to all members of the Indiana General Assembly and to the Washington, D.C. and Indiana offices of the State's congressional delegation. The Division of Public Affairs also issued a media advisory about the NHS and the three public meetings and made arrangements for a media briefing prior to each meetings. Handouts were available to the media which gave pertinent information about the NHS.

At the public meetings there was both a formal presentation about the NHS and Indiana's proposal and an open forum for questions and comments. The meetings were followed by a two week comment period. After this two week period and review of the input, INDOT made appropriate adjustments to the proposal and submitted the proposal for Indiana's portion of the National Highway System to the Federal Highway Administration, Indiana Division on May 27, 1993.

There have been three amendments to the original May 27, 1993 proposal. Information about these amendments follows:

- July 22, 1993 Amendment - Added SR 66 between I-164 and the proposed Rockport bridge over the Ohio River at US 231. This amendment was in response to strong support from the Evansville MPO.

- October 18, 1994 Modification - Added SR 32 between US 27 and the Ohio State Line. This modification was in response to instructions from the Federal Highway Administration and provide for system continuity with the State of Ohio.
- February 23, 1994 Amendment - Added US 24 between US 41 and SR 25. This amendment was in response to a request from Congressman Buyer that INDOT reevaluate this section of US 24 for inclusion on the state's NHS proposal. After this reevaluation INDOT concluded that this section of US 24 should be included and requested that the functional classification be upgraded to a principal arterial from I-65 to SR 25 to accommodate the amendment.

There was one additional change to the final NHS proposal. That change was deletion of SR 62 between I-65 and the Indiana Army Ammunition Plant near Jeffersonville. This military installation is closing and the STRAHNET connector (SR 62) may be removed. With completion of the I-265 extension (known as SR 265) to SR 62, the other major reason for including SR 62 (service to the Clark Maritime Center) is no longer an issue.

All of Indiana's NHS proposal including the above amendments and modifications were accepted by the Federal Highway Administration, Indiana Division, Region V, and Headquarters in Washington, D.C. The State's proposal was included in the Secretary of Transportation's December 9, 1993 NHS submittal to congress. The final system submittal includes 158,674 miles with 118,834 rural miles and 39,840 urban miles. Indiana's share of this system is 2,897 miles with 2,243 rural miles and 654 urban miles. **Figure 13** illustrates the proposed Indiana portion of the National Highway System. The target mileage given to Indiana in the June 12, 1992 Instruction for Completing the National Highway System was 3,040 miles.

Establishing the NHS was an important undertaking. This system will impact the state's ability to sustain and improve its economic position in the region and in the United States. The NHS will be an interconnected system of highways constructed to high design standards which will provide a high level of service to all regions of the state and connect them to Indiana's external markets.

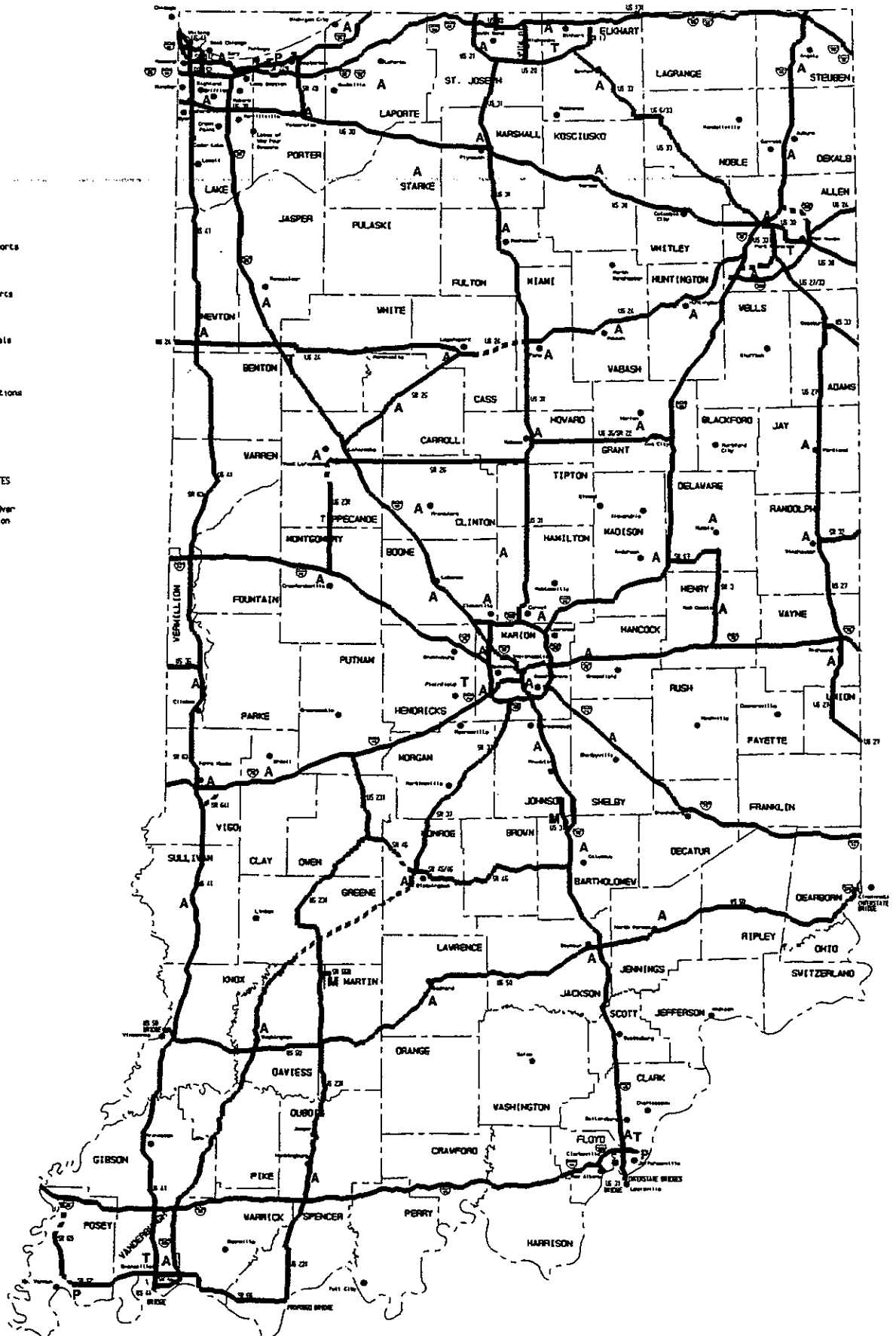
FIGURE 13

INDIANA NATIONAL HIGHWAY SYSTEM PROPOSAL

LEGEND

- A State System Airports
- P River and Lake Ports
- T Intermodal Terminals
- M Military Installations

- EXISTING
- PROPOSED ROUTES
- Urban Areas Over 5000 Population



MAY 27, 1993-AMENDED JULY 22, 1993 & FEB. 23, 1994

MODIFIED PER FHWA OCTOBER 18, 1993

Large Expansion Projects and Investment Studies

Background

In the summer of 1994 a series of six INDOT District Planning and Project Programming meetings were held in statewide. At this meetings the INDOT projects which are under development and programmed for construction in the 1995-1999 time frame were presented for public review and comment. In addition, the project and corridor studies that INDOT currently has in progress or is anticipating to begin in the near future were discussed. This section summarizes the projects and studies which were discussed at these meetings and presents the major investment program that is currently envisioned by INDOT at this time.

Large Expansion Projects

Indiana's large highway expansion projects (added travel lanes to an existing roadway or the construction of a new roadway) with a cost exceeding \$10.0 million are shown in **Table 10**. These projects add capacity to the highway system and improve regional accessibility which in turn may enhance the economic development potential of a local area. Large highway expansion projects require an extensive amount of development time prior to construction. Highway widening projects normally take approximately 6.5 years for development while new highway construction projects take approximately 7.0 years from inception to construction. The length of development time means that large expansion projects which are proposed for construction in the 1995 to 1999 time frame are already in the INDOT production schedule and are under development. **Table 10** below and **Figure 14** identify and illustrate Indiana's large expansion projects which are programmed for construction in the 1995 to 1999 time period.

As noted in the footnote on **Table 10**, the projects listed have one of two potential funding sources. They are:

1. Traditional highway funding sources, such as National Highway System, Surface Transportation Program and state fuel tax revenues which the department receives on a basis determined by relatively long-term federal and state legislative programs (e.g., Intermodal Surface Transportation Efficiency Act of 1991).
2. Special federal funding which is secured by the Indiana Congressional delegation as demonstration projects in annual appropriation bills.

Table 10
Indiana's Large Highway Expansion Projects, 1995-1999*

Route	Length	Estimated Cost	Description
I-65	9.0	\$265,036,000	Added travel lanes from the Ohio River to S.R. 311 at Sellersburg.
I-69**	N.A.	\$835,000,000	Interstate facility extension from I-64 to Bloomington.
I-69	N.A.	\$10,500,000	Interchange modification at U.S. 24 in Allen County.
I-80/I-94***	N.A.	\$90,000,000	Interchange modification at S.R. 912 (Cline Avenue).
I-465	N.A.	\$10,235,000	Interchange modification from 0.1 miles south of Shadeland Avenue (northbound bridge) to Fall Creek Bridge.
U.S. 24**	12.0	\$89,551,000	Road construction from Logansport to Peru.
U.S. 24**	15.7	\$56,942,000	Road construction from Wabash to Huntington.
U.S. 27	4.9	\$16,623,000	Added travel lanes (including bridges) from U.S. 33 to the dual lane section of U.S. 27 in Adams County.
U.S. 30	2.75	\$10,603,000	Added travel lanes from Illinois/Indiana State Line to 1.1 miles west of U.S. 41 in Lake County.
U.S. 33	3.98	\$14,068,000	Added travel lanes and road reconstruction from Douglas Road to Indiana/Michigan State Line in St. Joseph County.
U.S. 41	6.0	\$26,105,000	Added travel lanes from 77th Street to the Little Calumet River in Lake County.
U.S. 50	8.00	\$35,719,000	Road construction and added travel lanes from 1.91 miles west of S.R. 241 to 2.05 miles east of C.R. 400 South in Knox County.
U.S. 231**	20.6	\$78,000,000	Road construction from S.R. 66 to I-64.
U.S. 231	7.20	\$34,498,000	Road relocation from 0.82 miles south of C.R. 500 South to U.S. 231/S.R. 43 interchange in Tippecanoe County.
S.R. 9	4.8	\$13,542,000	Added travel lanes from S.R. 18 to the Mississinewa River and from S.R. 37 to 11th Street in Marion.
S.R. 23	6.11	\$16,472,000	Added travel lanes from Eddy Street to 5.6 miles south of the Indiana/Michigan State Line in St. Joseph County.
S.R. 23	3.9	\$10,640,000	Added travel lanes from Twyckenham Drive to Cleveland Road in South Bend and Mishawaka.
S.R. 46	3.50	\$11,200,000	Added travel lanes from Ellettsville to S.R. 37 in Monroe County.
S.R. 62	10.8	\$34,000,000	Added travel lanes from I-164 to Boonville.
S.R. 66	10.3	\$24,000,000	Added travel lanes from Green River Road to east of S.R. 61.
S.R. 67	8.00	\$22,686,000	Added travel lanes from I-69 to Muncie Bypass in Delaware County.
S.R. 69	21.00	\$45,686,000	Road construction from S.R. 62 to I-64 in Posey County.
S.R. 641	6.0	\$45,500,000	Road construction from U.S. 41 to I-70/S.R. 46 interchange in Vigo County.

Source: INDOT, Transportation Planning Division, 1994.

*Estimated cost exceeding \$10.0 million.

**Special funding projects which will be constructed as funding becomes available.

***A total of \$20.0 million has been secured. The remaining balance requires special funding and the remainder of the project will be constructed as funding becomes available.

[illegible]

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ATL...ADDED TRAVEL LANES
IC MOD...INTERCHANGE MODIFICATION
RD CN...ROAD CONSTRUCTION
RD RL...ROAD RELOCATION

A total of \$647,113,000 of traditionally funded projects of \$10.0 million or more is shown in **Table 10**. Projects under \$10.0 million total cost are estimated statewide at approximately \$100.0 million for the 1995-1999 time period. This results in a program of anticipated 1995-1999 highway improvements using traditional revenues of approximately \$750.0 million.

Table 10 also contains \$1,149,493,000 of projects identified for special federal funding. These projects would not advance to construction until special federal funding has been secured.

Large Investment Studies

A number of corridor and major project studies are currently underway which indicate the future projects which have the potential to begin the development process in the near future. These studies represent feasibility assessments which will provide a estimate of the proposed improvements return on the state's investment. It should be noted that many of these investment studies are for large scale projects which are beyond the funding ability for the normal INDOT improvement program. The proposed projects which fall into this category must rely upon potential special funding secured by the Indiana Congressional delegation as demonstration projects in annual appropriation bills. The large investment studies which are currently under development are shown in **Figure 15** and **Table 11** below.

Table 11
Large Highway Investment Studies

Route	Description
I-65	Louisville Freeway Incident Management Study
I-65	New interchange justification at the Marion-Johnson County Line Road.
I-69/S.R. 37	75th Street in Indianapolis to S.R. 213 in Hamilton County.
I-70	New interchange Justification at Six Points Road in Hendricks County.
I-70	New Interchange Justification at 25th Street in Terre Haute.
I-80/I-94	Intelligent Transportation Systems/Implementation Study for the Borman Expressway
U.S. 24	Corridor study from Ft. Wayne to Toledo, Ohio.
U.S. 31	Corridor study from I-465 to Westfield
U.S. 31	U.S. 31 corridor analysis in Kokomo.
U.S. 31	Corridor study from Plymouth to South Bend
U.S. 231	Huntingburg/Jasper corridor feasibility study from I-64 to S.R. 56
S.R. 25	Corridor study from Lafayette to Logansport.
S.R. 64	Wabash River bridge study at Mt. Carmel, Illinois
Ohio River	New Ohio River bridge in the Greater Metropolitan Louisville area.
Northwest Indiana	Gary-Chicago-Milwaukee Corridor
Indianapolis	Indianapolis Intelligent Transportation System Early Deployment Study.

Source: INDOT, Transportation Planning Division, 1994.




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1995-2015 Statewide Funding Forecasts For Expansion Projects

INDOT's current forecasts of revenue and operating costs estimate that approximately \$425.0 million will be available for highway construction projects. INDOT schedules the project development process such that a \$500.0 million program of projects becomes ready for construction each year. The program is comprised of

- Preservation Projects - \$350.0 million
- Expansion Projects - \$ 150.0 million

The level of the project development program exceeds forecasted available funding for two (2) primary reasons:

1. Problems occur during the development of a project which delays its construction schedule. The availability of another project ready for construction insures the available funds will be used and no potential construction funds lost to the State of Indiana.
2. Indiana is successful in attracting additional discretionary funding because a needed project is ready to go to construction and the federal funds are available.

The program is managed to assure that Indiana is prepared to use any available funding without investing resources in the development of projects whose construction cannot be funded within a reasonable length of time.

Forecasting expenditures for expansion projects for the twenty (20) year period 1995-2015 results in a \$3.0 billion program for state jurisdiction and highway improvements in rural and urbanized areas. Based upon this forecast approximately \$750.0 million would be programmed to fund state jurisdiction projects in both rural and urbanized areas in the 1995-1999 time period.

Statewide Highway System Plan Development: The Next Step

Following the development of the Statewide Multimodal Transportation Macro-level Plan work will be focused upon the development of a Statewide Highway System Plan. This planning process will be much more specific than the Marco-level process and focus on the development of corridor level improvements and the priority of system expansion projects. The intention is to develop the

statewide highway system-level planning process to support the identification and prioritization of state highway jurisdiction projects for the mandated update of the Non-Attainment Metropolitan Planning Organization (MPO) plans in 1997. The relationship between activities making up the systems planning process is shown in **Figure 16**. This figure illustrates the linkages between the forecasting of future travel demand, the management systems, the decentralized planning processes at the MPO and INDOT District levels, the use of benefit-cost analysis, and the consideration of future funding forecasts in selection of improvement projects.

Work on the development of system planning tools for the development for the plan is in progress. The Major Corridor Investment- Benefit Analysis System Study has been initiated to develop both a statewide travel demand model to forecast future traffic and a economic impact analysis model to determine employment and income impacts of transportation investments. Procedures will be developed to fully evaluate corridor highway improvements proposed by corridor coalitions of community groups focused upon economic development strategies. The Investment-Benefit Analysis system will allow a comprehensive evaluation of both user benefits and economic benefits for consideration in return on investment analysis..

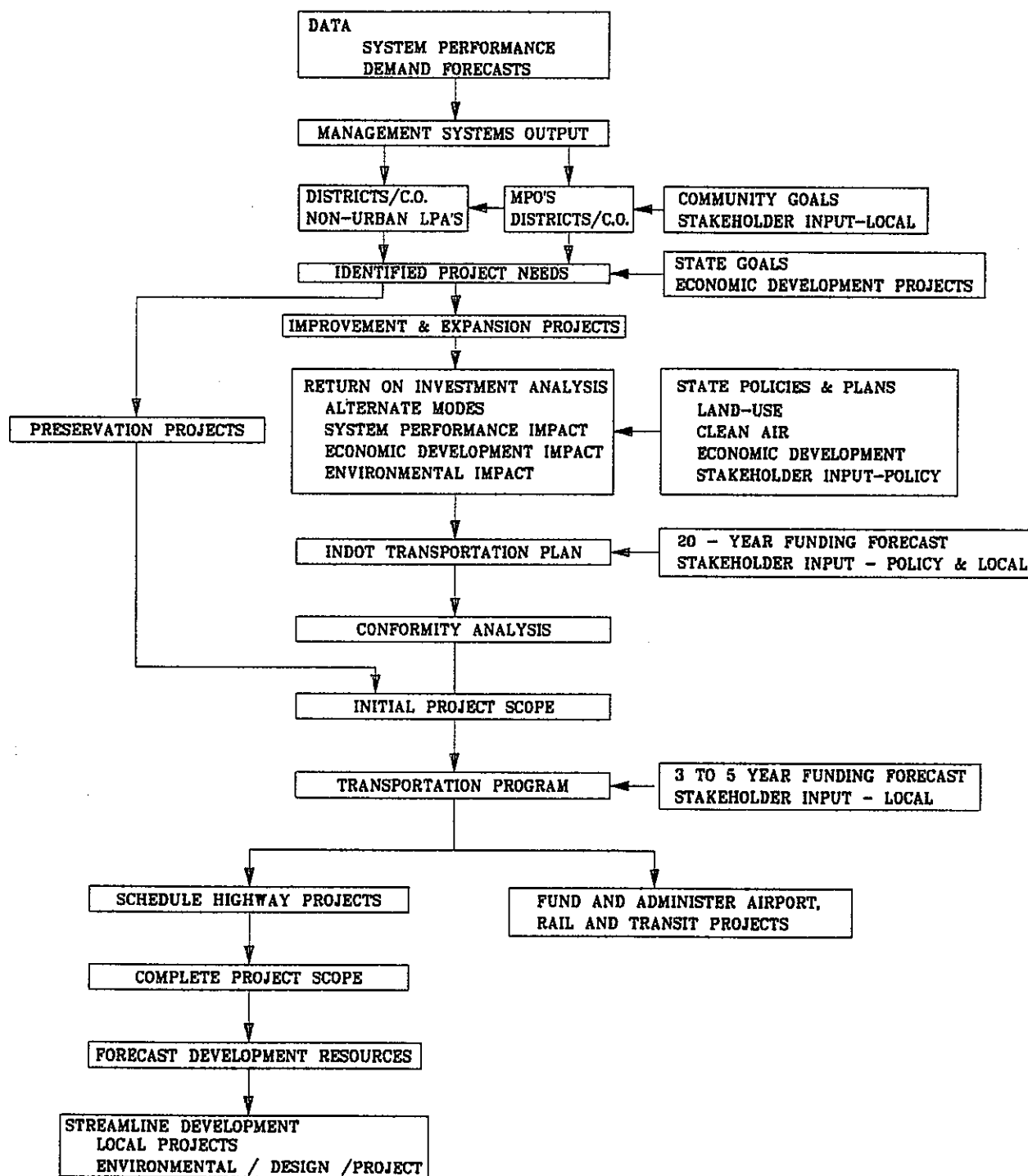
To complement the investment-benefit analysis system additional system-planning tools will be developed to better evaluate proposed improvements. The highway system planning tools will use and be coordinated with the management systems, such as, congestion, intermodal, and safety, to provide an effective planning process. Models will be developed to allow the evaluation of highway system conditions and the identification and analysis of deficiencies. Economic models will be developed to prepare highway funding forecasts and for the assessment of innovative financing options.

The identification of proposed transportation improvements will be developed from the cooperative MPO/State urban transportation planning process. INDOT will use its highway District transportation planning process for those areas outside MPO boundaries. Both planning processes will be structured to provide continuous and effective transportation stakeholder involvement in the development of transportation plans.

The following system planning products will be produced to assist the project selection process:

FIGURE 16

1995 INDIANA TRANSPORTATION PLANNING AND PROGRAMMING PROCESS



- *Planning Profiles of INDOT Districts* containing:
 1. A review of pertinent socio-economic factors conditions affecting travel demand;
 2. An overview of travel patterns, inventory of multimodal transportation systems and facilities;
 3. An identification of problem areas;
 4. An inventory of local expectations in terms of new or improved transportation facilities;
 5. An analysis of alternative improvement concepts;
 6. A review of fiscal conditions;
 7. Recommended improvements by priority, and;
 8. A summary of community participation activities. The evaluation of roadway systems will include a review of functional classification, jurisdiction responsibility, as well as unique roadway function.

- *Incorporation of the cooperative urban transportation process being carried out in the state's twelve (12) urbanized areas.* The systems planning process recognizes the lead role of the MPO in conducting transportation planning in the Metropolitan Planning Area. The information developed in this cooperative process will be incorporated into the preparation of route development concept reports for state jurisdiction roadways.

- *Route Development Concept Reports.* These reports will outline how a particular highway route will develop over the next 20 to 30 years in terms of number of lanes, design standards, access control, intermodal considerations, and special functions (scenic route, heavy truck route, etc.). The report should address a financially unconstrained concept as well as a financially constrained concept based upon the routes priority determined in the system level planning process. The concept reports are anticipated to be the tool to let communities know what they can expect for development of State highway routes in their area. The detail of the report should be sufficient to assist the community in land use planning and economic development activities. In addition the reports will guide initial INDOT programming and project scoping activities.